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Mineral Resource Report 91
Part 1
1985

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COAL RESOURCES OF FAYETTE COUNTY, PENNSYLVANIA

PART 1. COAL CROP LINES, MINED-OUT AREAS, AND STRUCTURE CONTOURS

Compiled by
James R. Shaulis

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
OFFICE OF RESOURCES MANAGEMENT
BUREAU OF
TOPOGRAPHIC AND GEOLOGIC SURVEY
Arthur A. Socolow, State Geologist

PY G345/
4.3
M91
Pt.1

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Mineral Resource Report 91
Part 1

COAL RESOURCES OF FAYETTE COUNTY, PENNSYLVANIA

PART 1. COAL CROP LINES, MINED-OUT AREAS, AND STRUCTURE CONTOURS

Compiled by James R. Shaulis
Pennsylvania Geological Survey

PENNSYLVANIA GEOLOGICAL SURVEY

FOURTH SERIES

HARRISBURG

1985

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Shaulis, James R.
Coal resources of Fayette
County, Pennsylvania

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CONTENTS

FIGURES

COAL RESOURCES OF FAYETTE COUNTY, PENNSYLVANIA

PART 1. COAL CROP LINES, MINED-OUT AREAS, AND STRUCTURE CONTOURS

Compiled by
James R. Shaulis

INTRODUCTION

An important goal of the Bureau of Topographic and Geologic Survey is to provide accurate, timely information on Pennsylvania's bituminous coal. To achieve this goal, the Bureau is working in cooperation with the U.S. Geological Survey to establish the National Coal Resources Data System (NCRDS). NCRDS is a computer data system developed by the U.S. Geological Survey to facilitate coal-resource calculations for the nation on a county-by-county and seam-by-seam basis, and to produce various types of tables and maps of coal characteristics.

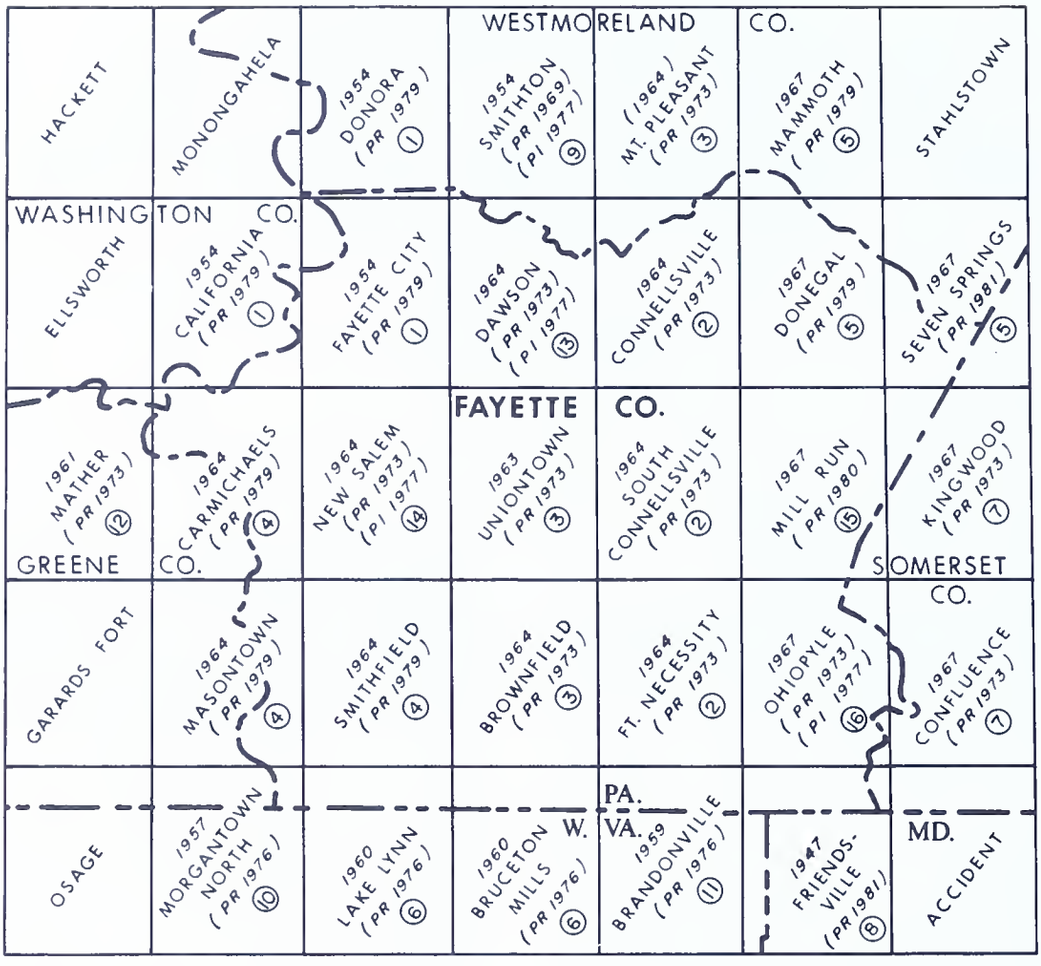
Before NCRDS can be used for a particular bituminous-coal-producing county, all available data on the coal must be entered into the computer system. These data include site-specific (point-location) stratigraphic measurements and coal analyses, and specific map elements compiled on 7½-minute topographic quadrangle maps. The map elements, which include coal outcrop lines and mined-out areas, are digitized and stored in the system for subsequent computer manipulations.

Inasmuch as the maps showing coal outcrop lines and mined-out areas are in constant demand by the coal industry, consultants, planners, government personnel, and academicians, they are being made available as part of the Pennsylvania Survey's Mineral Resource Report series. These maps will be of considerable help in exploration program planning, land acquisition, land use planning, and environmental protection.

Two types of coal maps may be included for each 7½-minute topographic quadrangle map covering Fayette County (Figure 1). First, there is a composite coal outcrop map for all the principal or economically significant coal seams in the quadrangle; this map also includes the structure contours and fold axes. Coals are not considered "principal" or "economically significant" if they are thin, laterally discontinuous, or lack sufficient data and a record of prior mining. In quadrangles where a coal seam is considered to have a sufficient extent and thickness to be economically significant, the coal crop line is shown as a solid line. Where this relationship does not extend into an adjacent quadrangle, a question mark is shown near the quadrangle boundary. Second, there is a separate map for each mined principal seam showing the extent of all known strip and deep mining, up to the time of compilation. If none of the principal coals have been mined or crop out in a particular quadrangle, only the first kind of map is included. Each map has an explanation of sources of published and unpublished data, map reliability, map symbols, structure-contour intervals and datums, and names of fold axes. The general layout of the compilation maps is shown in Figure 2.

The map-reliability terms for structure contours are defined as follows: very good, ± 10 feet; good, ± 20 feet; fair, ± 50 feet; and poor, $\pm > 50$ feet. Because the coal crop lines are, for the most part, derived using interval projections from a given structural datum, their map-reliability terms have the same relative degrees of accuracy as the reliability terms for the structure contours.

Three separate datums were used to draw structure contours: (1) the base of the Pittsburgh coal seam; (2) the top of the Upper Freeport coal seam; and (3) the top of the Burgoon Sandstone. In the areas of the county where these datums are shown,



Based on aerial photography taken:

① 1952 and 1977.
② 1962 and 1973.
③ 1962, 1963, and 1973.
④ 1962, 1963, and 1977.
⑤ 1967 and 1977.
⑥ 1956 and 1976.
⑦ 1966 and 1973.
⑧ 1946 and 1974.
⑨ 1952, 1969, and 1977.
⑩ 1955 and 1976.
⑪ 1957 and 1976.
⑫ 1958 and 1973.
⑬ 1962, 1973, and 1977.
⑭ 1962, 1963, 1973, and 1977.
⑮ 1966 and 1977.
⑯ 1966, 1973, and 1977.

Figure 1. Index map of 7½-minute quadrangles in Fayette County. Date of publication of topographic quadrangle map is shown in italic type. Dates of photorevision (PR) and photoinspection (PI) are shown in parentheses.

they represent the geologic horizons for which the most accurate structural control could be established.

These maps represent a modification and revision of the county mapping done by Hickok and Moyer (1940), and mapping by Shaffner (1963) in northeast Fayette County. Since both reports were done, new data have become available as a result of detailed coal-exploration programs, increased surface-mining activities, and more accurate 7½-minute topographic bases. This new information has mainly been used to revise the structure and stratigraphy of the area east of Chestnut Ridge. The area west of Chestnut Ridge had previously been mapped using information derived from the mining of the Pittsburgh coal seam which underlay about 60 per-

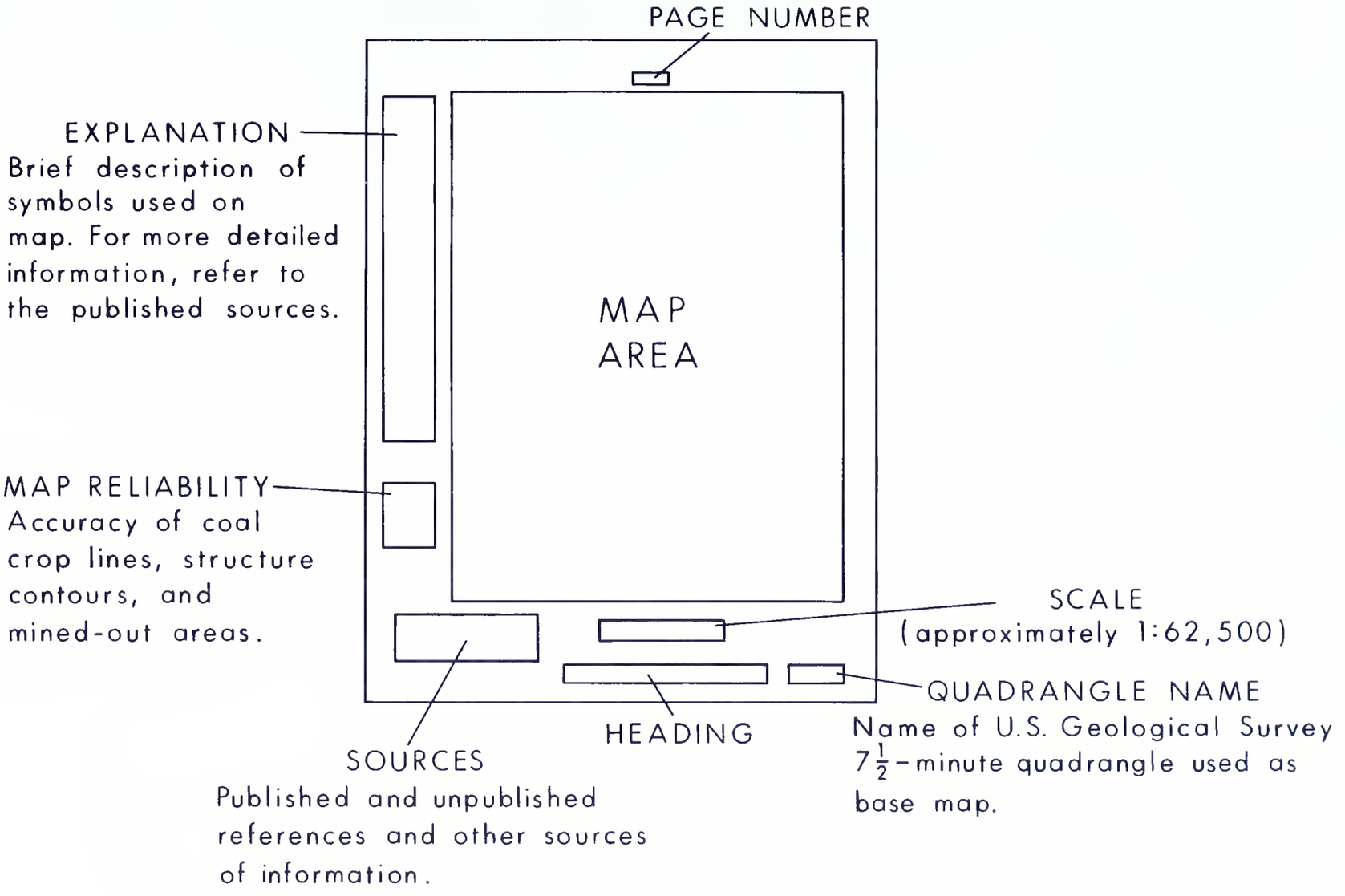


Figure 2. Guide to layout of compilation maps.

cent of the western part of the county. Because this seam was extensively mined, good structural control was available for geologic mapping. Therefore, only slight modifications were made to the previous mapping of Hickok and Moyer (1940) in this area of the county.

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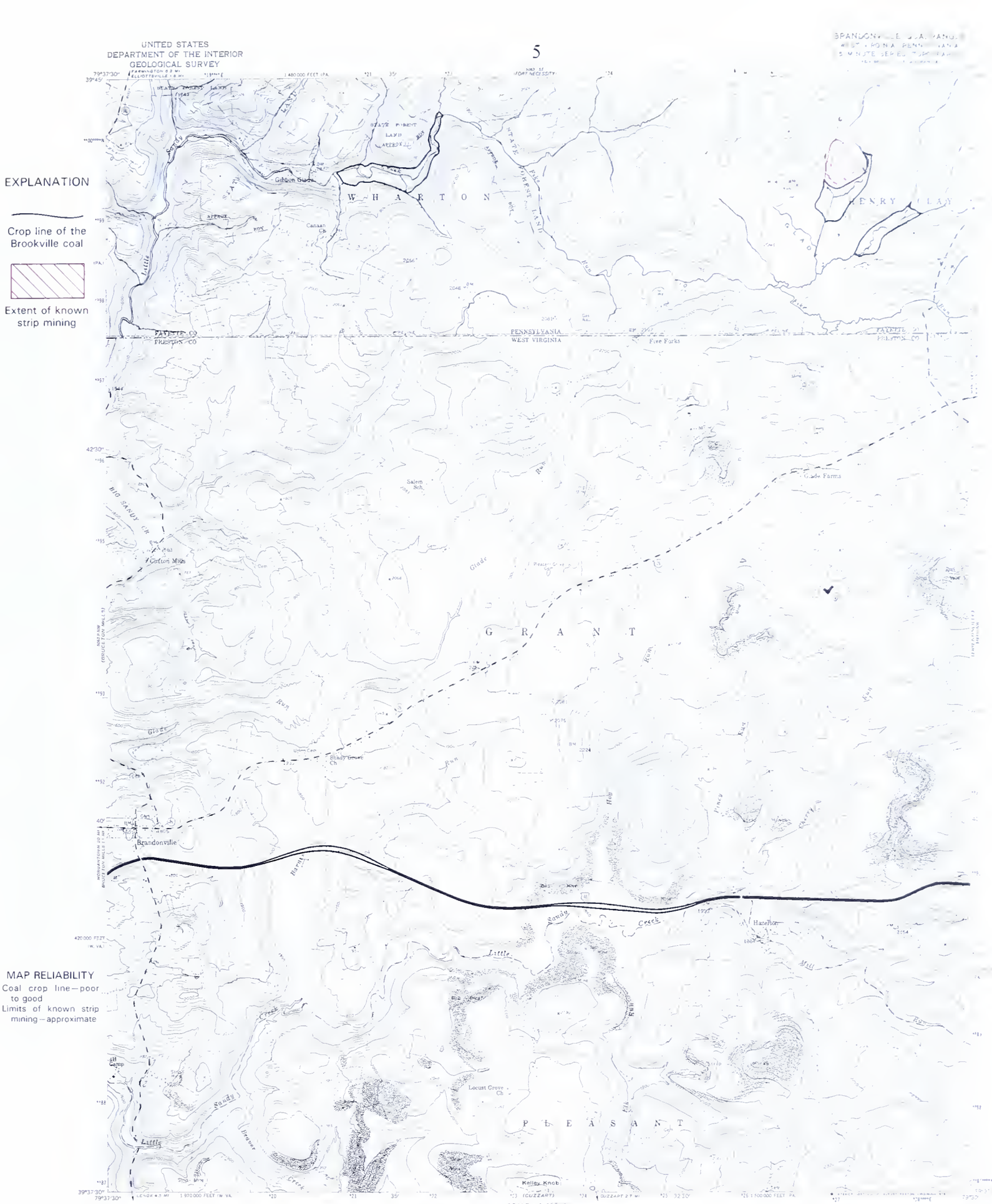
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

BRANDONVILLE QUADRANGLE
WEST VIRGINIA-PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



SOURCES

Crop line compiled by J. R. Shaulis from unpublished data; some reference to Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p. Limits of strip mining based on field checking

SCALE 1:62,500

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

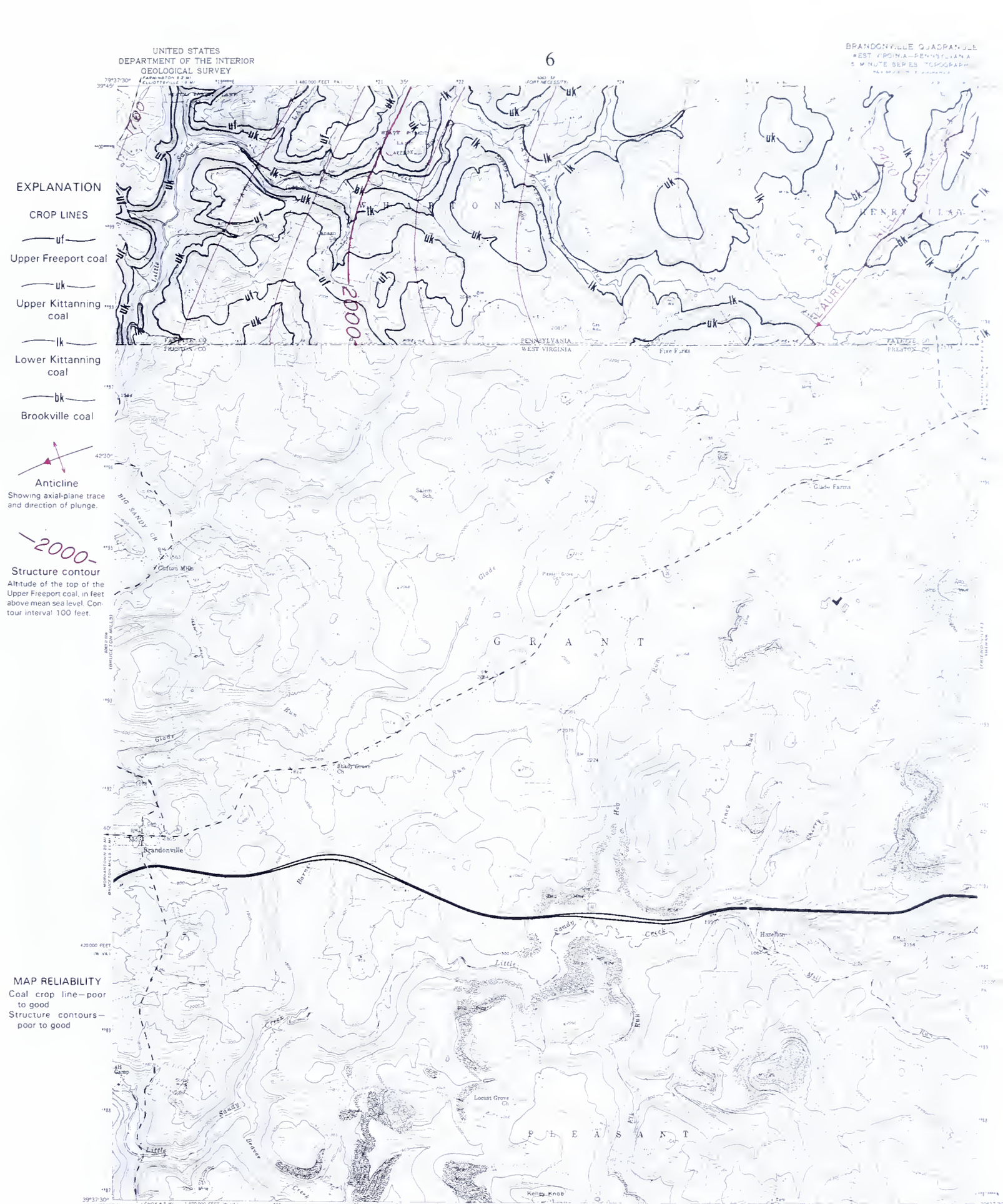
ROAD CLASSIFICATION
Medium duty — Light duty
Unimproved dirt
U.S. Route — State Route

BRANDONVILLE

CROP LINE AND MINED-OUT AREA OF THE BROOKVILLE COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

BRANDONVILLE QUADRANGLE
WEST VIRGINIA—PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



BRANDONVILLE

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Upper Freeport coal

Extent of known strip mining

MAP RELIABILITY

Coal crop line—fair to very good

Limits of known strip mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from unpublished data, minor reference to Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p

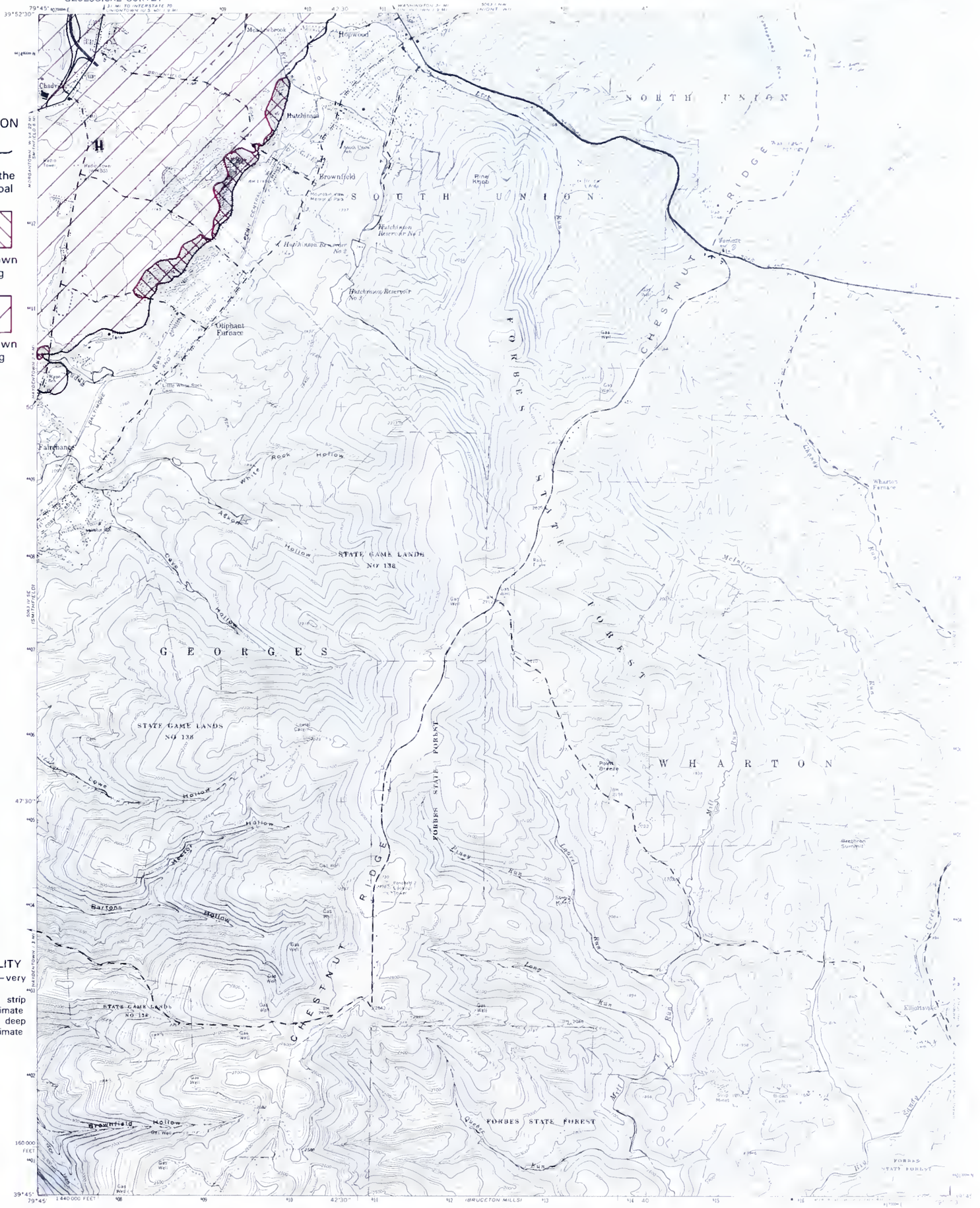
Limits of strip mining based on field checking.

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

BROWNFIELD

CROP LINE AND MINED-OUT AREA OF THE UPPER FREEPORT COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map.

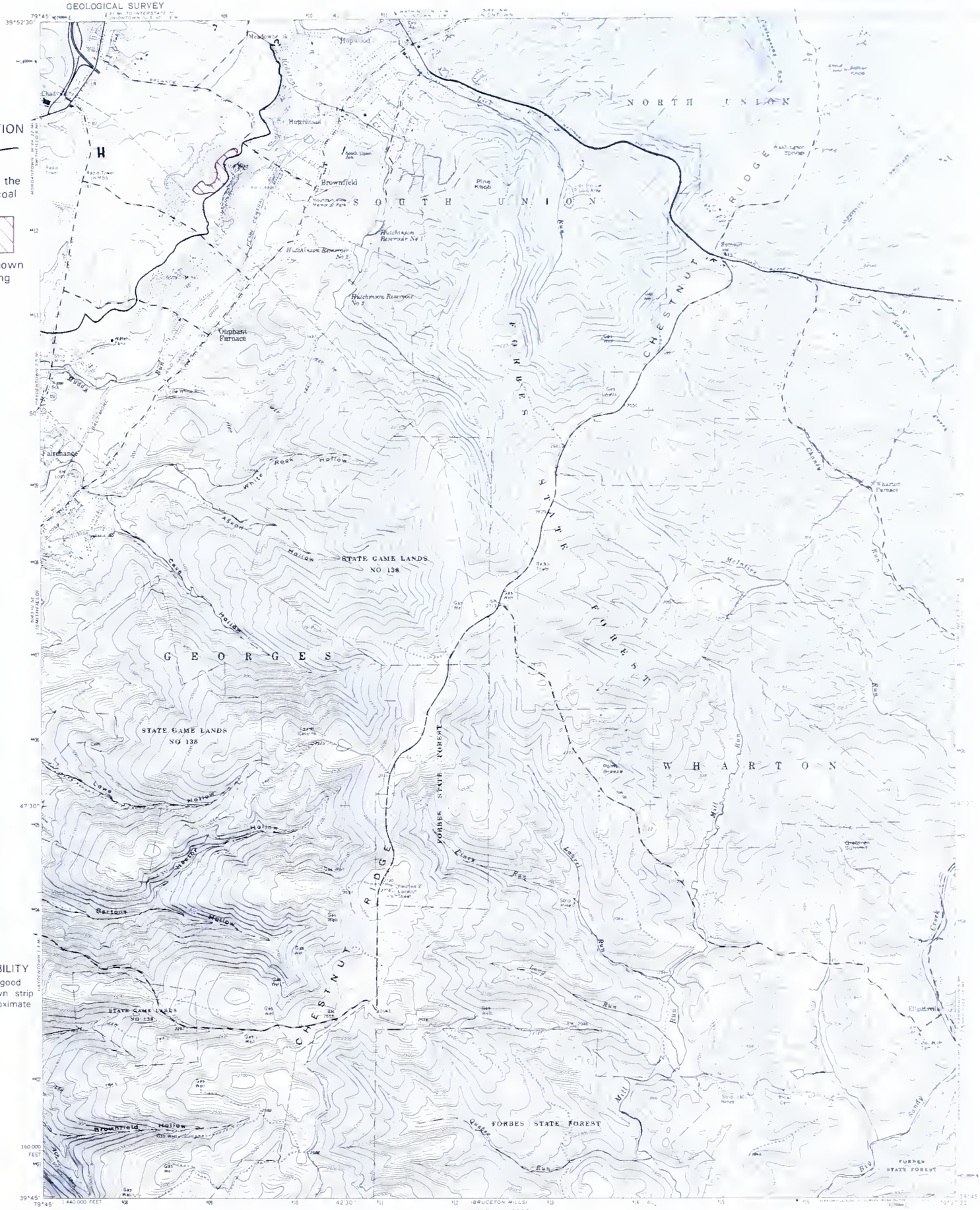
Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

BROWNFIELD

CROP LINE AND MINED-OUT AREAS OF THE

PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



SOURCES

Crop line slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.

BROWNFIELD

CROP LINE AND MINED-OUT AREA OF THE REDSTONE COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Sewickley coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—good
Limits of known strip mining—approximate
Limits of known deep mining—approximate

SOURCES

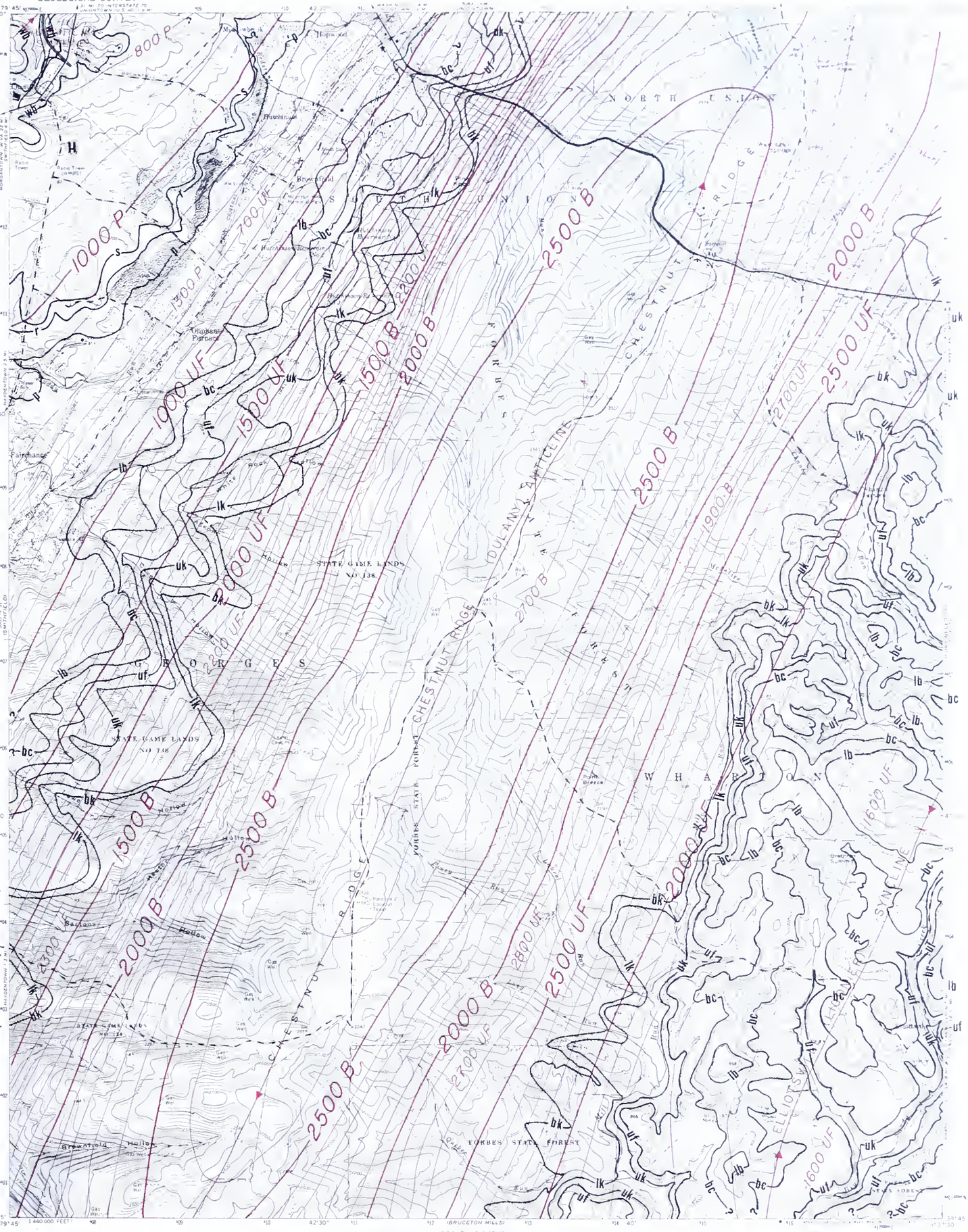
Crop line slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.
Limits of deep mining from unpublished mine maps.

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

BROWNFIELD

CROP LINE AND MINED-OUT AREAS OF THE SEWICKLEY COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

CROP LINES

- wb — Waynesburg coal
- s — Sewickley coal
- r — Redstone coal
- p — Pittsburgh coal
- lb — Lower Bakerstown coal
- bc — Brush Creek coal
- uf — Upper Freeport coal
- uk — Upper Kittanning coal
- lk — Lower Kittanning coal
- bk — Brookville coal

Anticline
Showing axial-plane trace and direction of plunge

Syncline
Showing axial-plane trace and direction of plunge

—1000 P— Base of Pittsburgh coal

—2000 UF— Top of Upper Freeport coal

—2500 B— Top of Burgoon Sandstone

Structure contours
Altitudes in feet above mean sea level. Contour interval 100 feet

MAP RELIABILITY
Coal crop lines—fair to very good
Structure contours—fair to very good

SOURCES

Crop lines slightly to extensively modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Structure contours on top of Upper Freeport coal and on top of Burgoon Sandstone compiled by J. R. Shaulis from unpublished data; minor reference to unpublished map by W. E. Edmunds (1976) and to Hickok and Moyer (1940). Structure contours on base of Pittsburgh coal compiled by A. D. Glover (1976) from Hickok and Moyer (1940).

BROWNFIELD

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SOURCES

Crop lines modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Structure contours compiled by J. R. Shaulis from unpublished data; minor reference to Hickok and Moyer (1940) and unpublished map by W. E. Edmunds (1976).

COAL CROP LINES AND STRUCTURE CONTOURS

BRUCETON MILLS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Pittsburgh coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—very good

Limits of known strip mining—approximate

Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

SCALE ≈1:62500

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

ROAD CLASSIFICATION

PENNSYLVANIA

QUADRANGLE LOCATION

CALIFORNIA

CROP LINE AND MINED-OUT AREAS OF THE

PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

CROP LINES

W — Waynesburg coal

R — Redstone coal

P — Pittsburgh coal

Anticline
Showing axial-plane trace and direction of plunge.

Syncline
Showing axial-plane trace and direction of plunge.

700 — Structure contour
Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet.

MAP RELIABILITY

Coal crop lines—good to very good

Structure contours—very good

SOURCES

Crop lines slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Structure contours compiled by A. D. Glover (1976) from Hickok and Moyer (1940) and Schweinfurth, S. P. (1967), *Geologic map of the California quadrangle, Washington and Fayette Counties, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ–648, scale 1:24,000.

SCALE ~1 62500

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

ROAD CLASSIFICATION

Heavy duty — Light duty

Medium duty — Unimproved dirt

U.S. Route — State Route

PENNSYLVANIA
QUADRANGLE LOCATION

CALIFORNIA

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Pittsburgh coal

Extent of known deep mining

MAP RELIABILITY

Coal crop line—very good

Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

CARMICHAELS

CROP LINE AND MINED-OUT AREA OF THE

PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Waynesburg coal

Extent of known strip mining

MAP RELIABILITY

Coal crop line—good
Limits of known strip mining—approximate

SOURCES

Crop line slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.

CARMICHAELS

CROP LINE AND MINED-OUT AREAS OF THE

WAYNESBURG COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

CROP LINES

w — Washington coal

wb — Waynesburg coal

r — Redstone coal

p — Pittsburgh coal

Anticline
Showing axial-plane trace and direction of plunge.

Syncline
Showing axial-plane trace and direction of plunge

Structure contour
Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

MAP RELIABILITY

Coal crop lines—good to very good
Structure contours—very good

SOURCES

Crop lines slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Structure contours compiled by A. D. Glover (1976) from Hickok and Moyer (1940) and Kent, B. H. (1969), *Geologic map of part of the Carmichaels quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-588, scale 1:24,000.

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1979 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

ROAD CLASSIFICATION

CARMICHAELS

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

CROP LINES

uf — Upper Freeport coal

uk — Upper Kittanning coal

1500 — Structure contour

Altitude of the top of the Upper Freeport coal, in feet above mean sea level. Contour interval 100 feet.

MAP RELIABILITY

Coal crop lines fair
Structure contours—fair

SOURCES

Crop lines and structure contours compiled by J. R. Shaulis from unpublished data. Minor reference to Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.; and Flint, N. K. (1965), *Geology and mineral resources of southern Somerset County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 56A, 267 p.

CONTOUR INTERVAL 2 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Primary highway all weather, hard surface
Secondary highway all weather, hard surface
U.S. Route
State Route

CONFLUENCE

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Clarion coal

Extent of known strip mining

MAP RELIABILITY
Coal crop line—poor to fair
Limits of known strip mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.

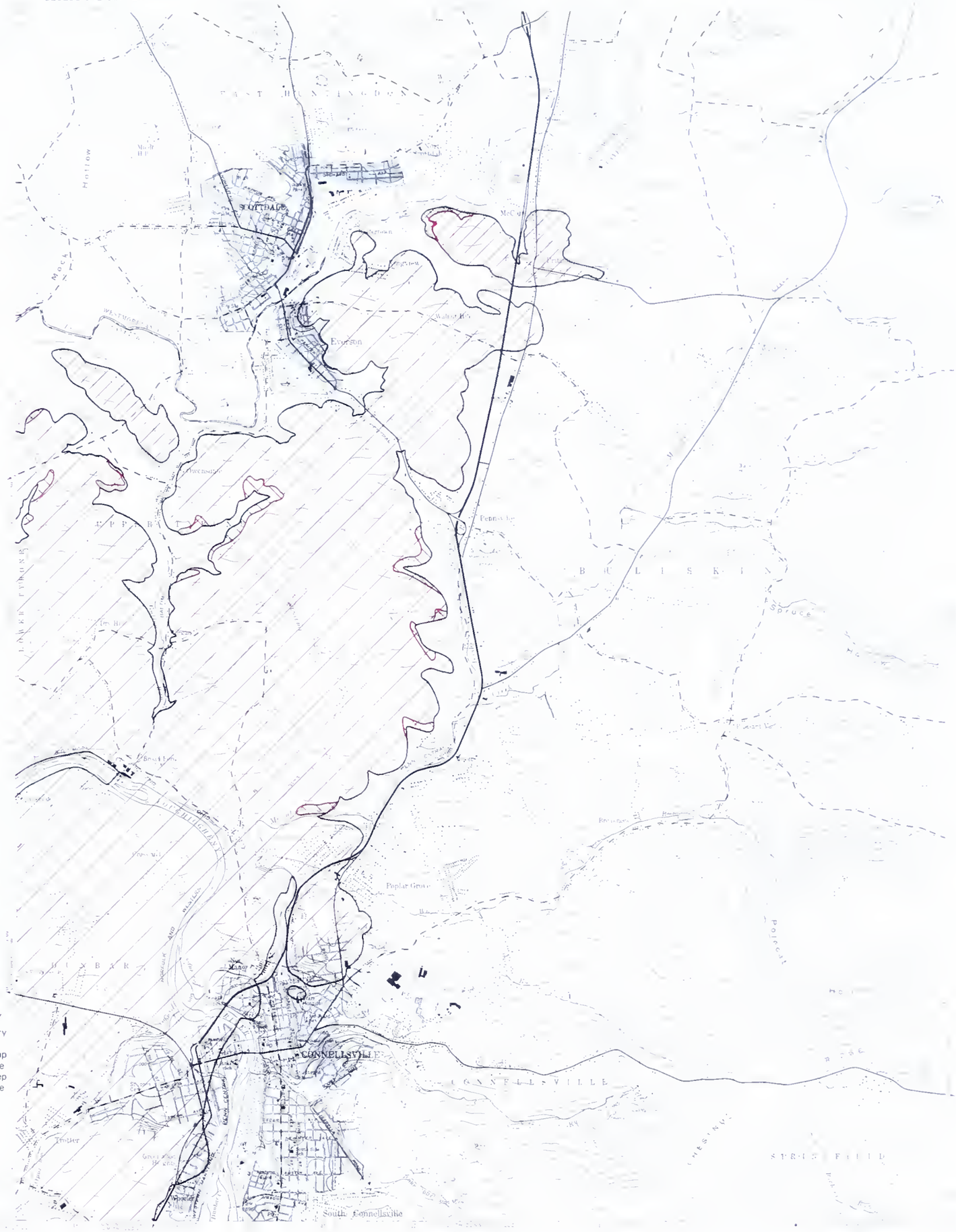
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

UTM GRID AND 1973 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

CONNELLSVILLE

CROP LINE AND MINED-OUT AREAS OF THE

CLARION COAL



EXPLANATION

Crop line of the Pittsburgh coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—very good

Limits of known strip mining—approximate

Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map.

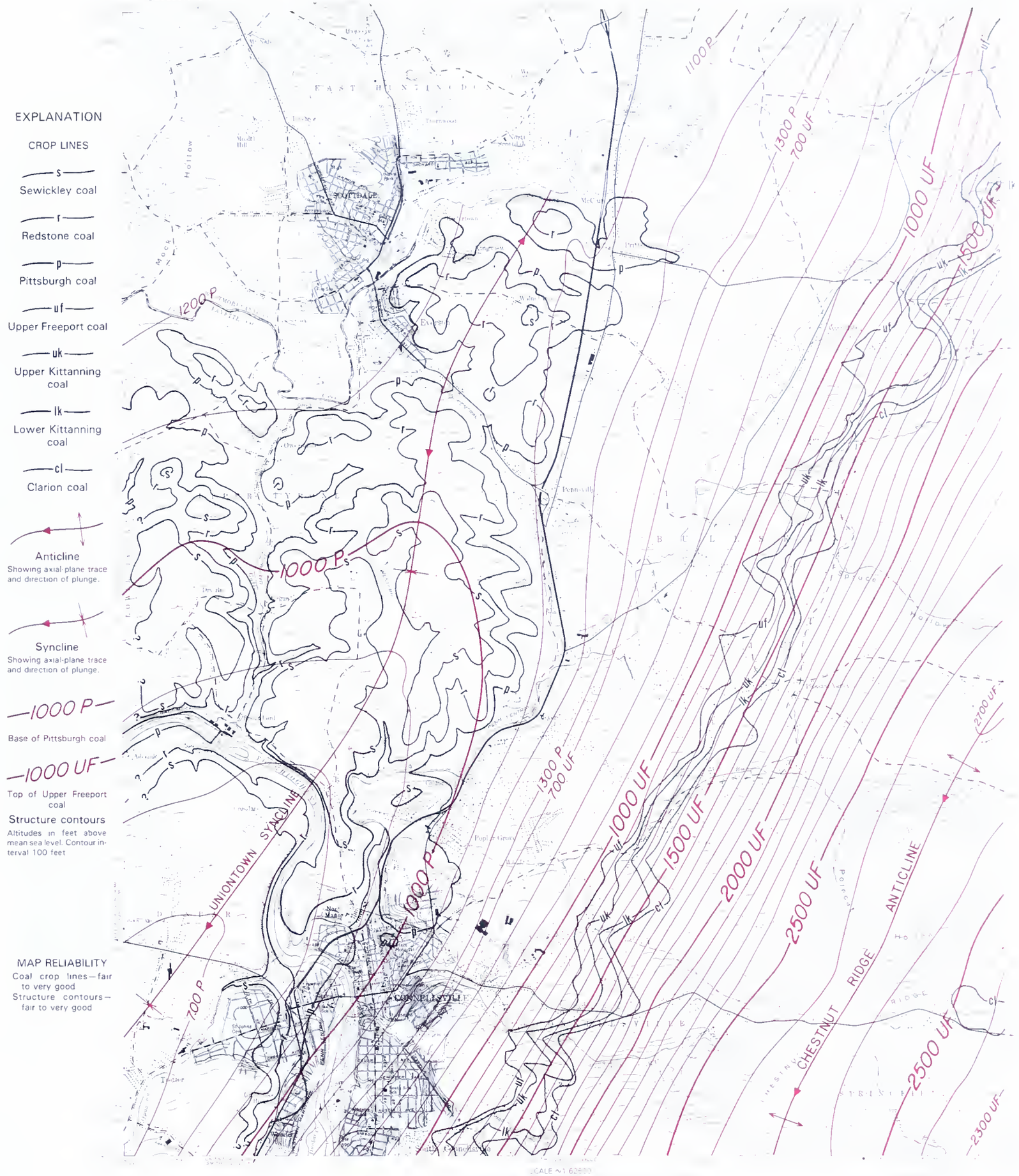
Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

CONNELLSVILLE

CROP LINE AND MINED-OUT AREAS OF THE

PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



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Structure contours on top of Upper Freeport coal compiled by J. R. Shaulis from unpublished data; minor reference to unpublished map by W. E. Edmunds (1976) and to Hickok and Moyer (1940). Structure contours on base of Pittsburgh coal compiled by A. D. Glover (1976) from Hickok and Moyer (1940).

CONNELLSVILLE

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Upper Freeport coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—good
Limits of known strip mining—approximate
Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from unpublished data, minor reference to Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.
Limits of deep mining from unpublished mine maps.

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
State Route

UTM GRID AND 1973 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

PENNSYLVANIA QUADRANGLE LOCATION

DAWSON

CROP LINE AND MINED-OUT AREAS OF THE
UPPER FREEPORT COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Lower Bakerstown coal

Extent of known strip mining

MAP RELIABILITY

Coal crop line—good to very good

Limits of known strip mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from unpublished data, minor reference to Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p. Limits of strip mining based on interpretation of topographic map and on field checking

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

DAWSON

CROP LINE AND MINED-OUT AREAS OF THE
LOWER BAKERSTOWN COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Pittsburgh coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—very good

Limits of known strip mining—approximate

Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

DAWSON

CROP LINE AND MINED-OUT AREAS OF THE

PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

CROP LINES

- wb — Waynesburg coal
- p — Pittsburgh coal
- lb — Lower Bakerstown coal
- uf — Upper Freeport coal
- mk — Middle Kittanning coal
- lk — Lower Kittanning coal

Anticline
Showing axial-plane trace and direction of plunge.

Syncline
Showing axial-plane trace and direction of plunge

1000 P — Base of Pittsburgh coal

1000 UF — Top of Upper Freeport coal

Structure contours
Altitudes in feet above mean sea level. Contour interval 100 feet

MAP RELIABILITY

Coal crop lines—good to very good
Structure contours—good to very good

SOURCES

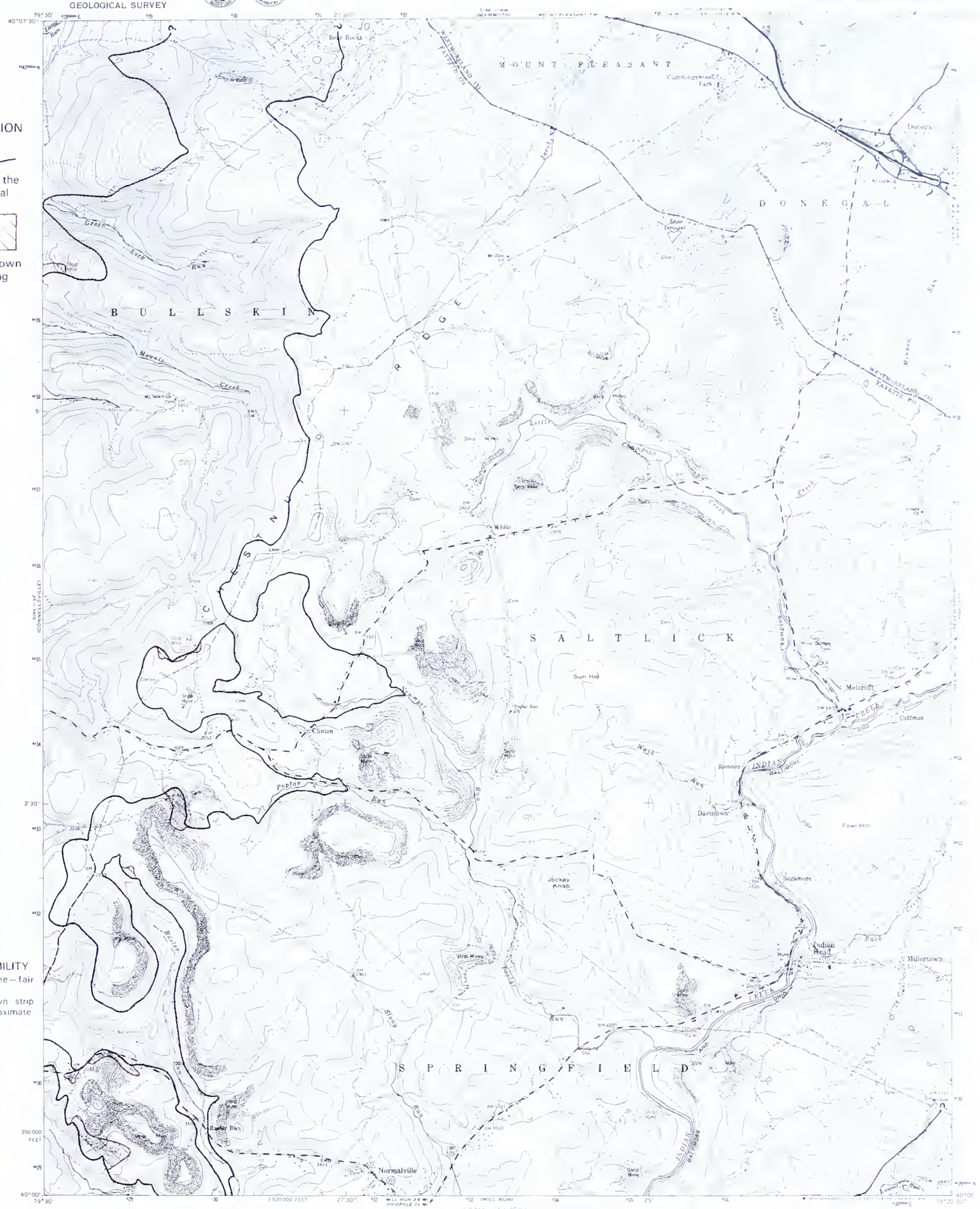
Crop lines modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*. Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Structure contours on top of Upper Freeport coal compiled by J. R. Shaulis from unpublished data; minor reference to Hickok and Moyer (1940). Structure contours on base on Pittsburgh coal compiled by A. D. Glover (1976) from Hickok and Moyer (1940).

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

DAWSON

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



SOURCES

Crop line modified by J. R. Shaulis from Shaffner, M. N. (1963), *Geology and mineral resources of the Donegal quadrangle, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., Atlas 48, 116 p.

Limits of strip mining based on interpretation of topographic map and on field checking

UTM GRID AND 1978 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, all weather, hard surface — Light duty road, all weather, improved surface
Secondary highway, all weather, hard surface — Unimproved road, fair or dry weather
Interstate Route — State Route

DONEGAL

CROP LINE AND MINED-OUT AREAS OF THE CLARION COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Middle Kittanning coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—fair to very good

Limits of known strip mining—approximate

Limits of known deep mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Shaffner, M. N. (1963), *Geology and mineral resources of the Donegal quadrangle, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., Atlas 48, 116 p.

Limits of strip mining based on interpretation of topographic map and on field checking

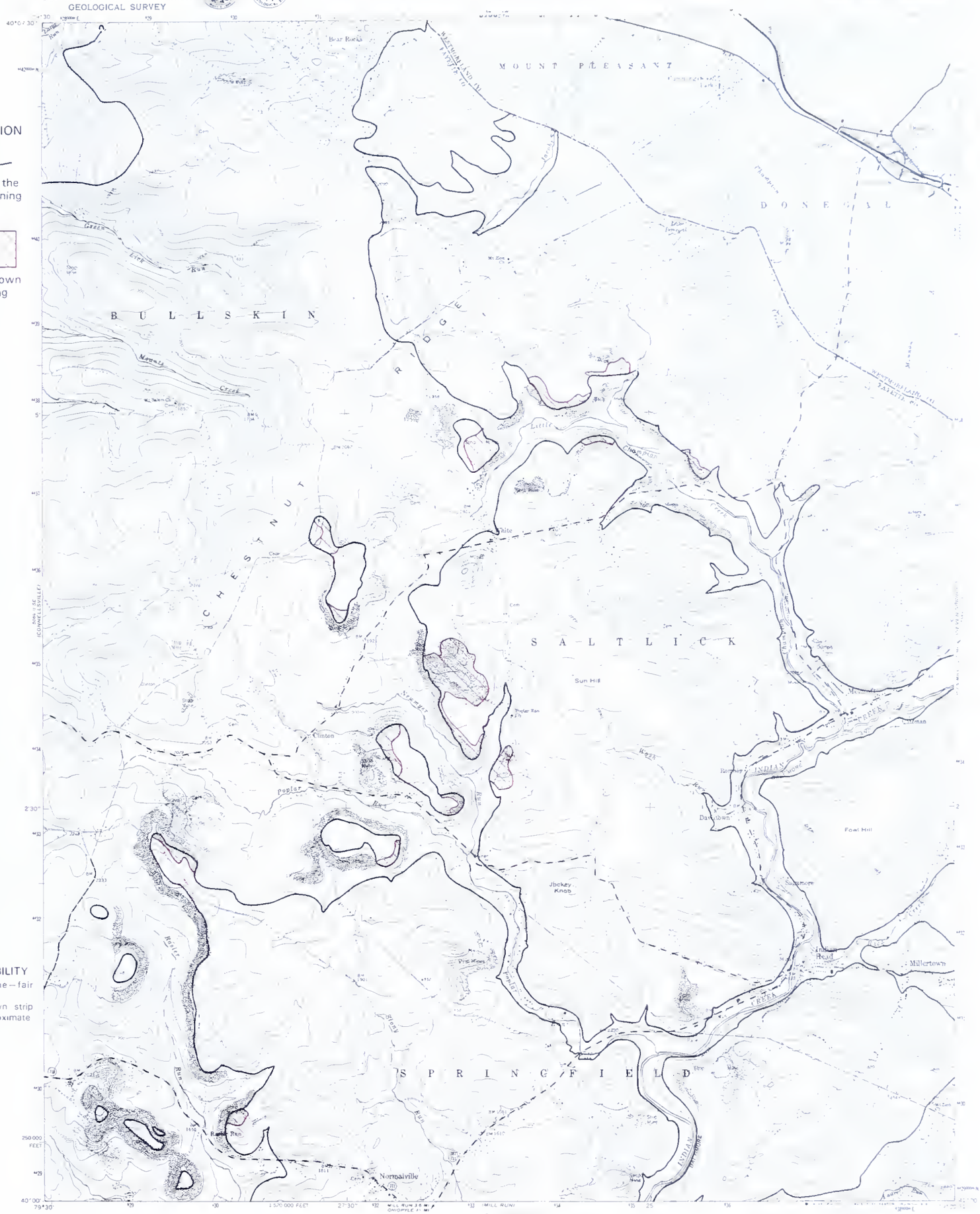
Limits of deep mining from Shaffner (1963) and unpublished mine maps.

DONEGAL

CROP LINE AND MINED-OUT AREAS OF THE

MIDDLE KITTANNING COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

Crop line of the Upper Kittanning coal

Extent of known strip mining

MAP RELIABILITY

Coal crop line—fair to good

Limits of known strip mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Shaffner, M. N. (1963). *Geology and mineral resources of the Donegal quadrangle, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., Atlas 48, 116 p.

Limits of strip mining based on interpretation of topographic map and on field checking.

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, all weather, hard surface — Light-duty road, all weather, improved surface

Secondary highway, all weather, hard surface — Unimproved road, fair to dry weather

Interstate Route — State Route

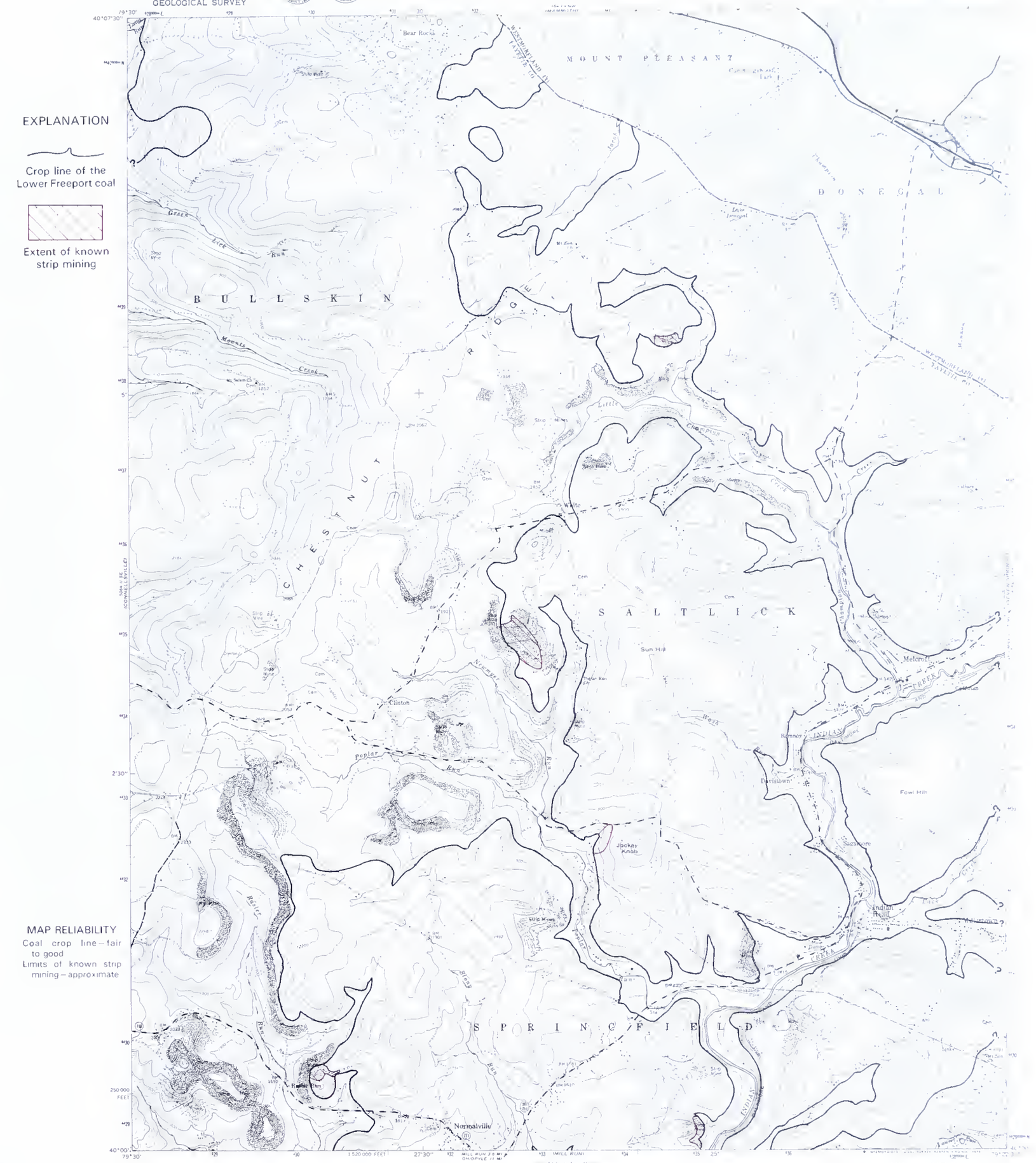
UTM GRID AND 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

DONEGAL

CROP LINE AND MINED-OUT AREAS OF THE

UPPER KITTANNING COAL

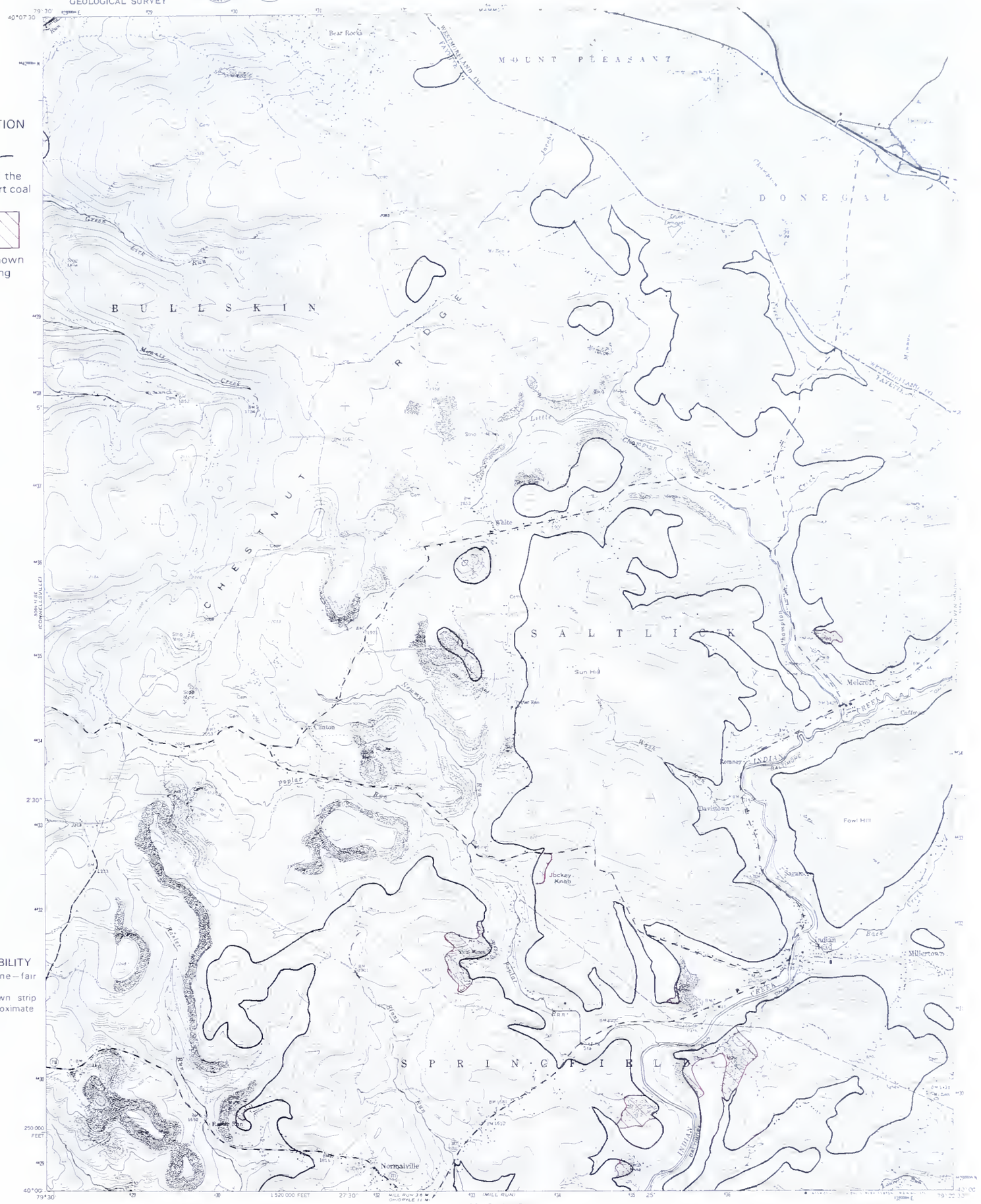
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



CROP LINE AND MINED-OUT AREAS OF THE

LOWER FREEPORT COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

Crop line of the Upper Freeport coal

Extent of known strip mining

MAP RELIABILITY

Coal crop line—fair to very good

Limits of known strip mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Shaffner, M. N. (1963). *Geology and mineral resources of the Donegal quadrangle, Pennsylvania*. Pennsylvania Geological Survey, 4th ser., Atlas 48, 116 p.

Limits of strip mining based on interpretation of topographic map and on field checking.

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, all weather, hard surface — Light-duty road, all weather, improved surface

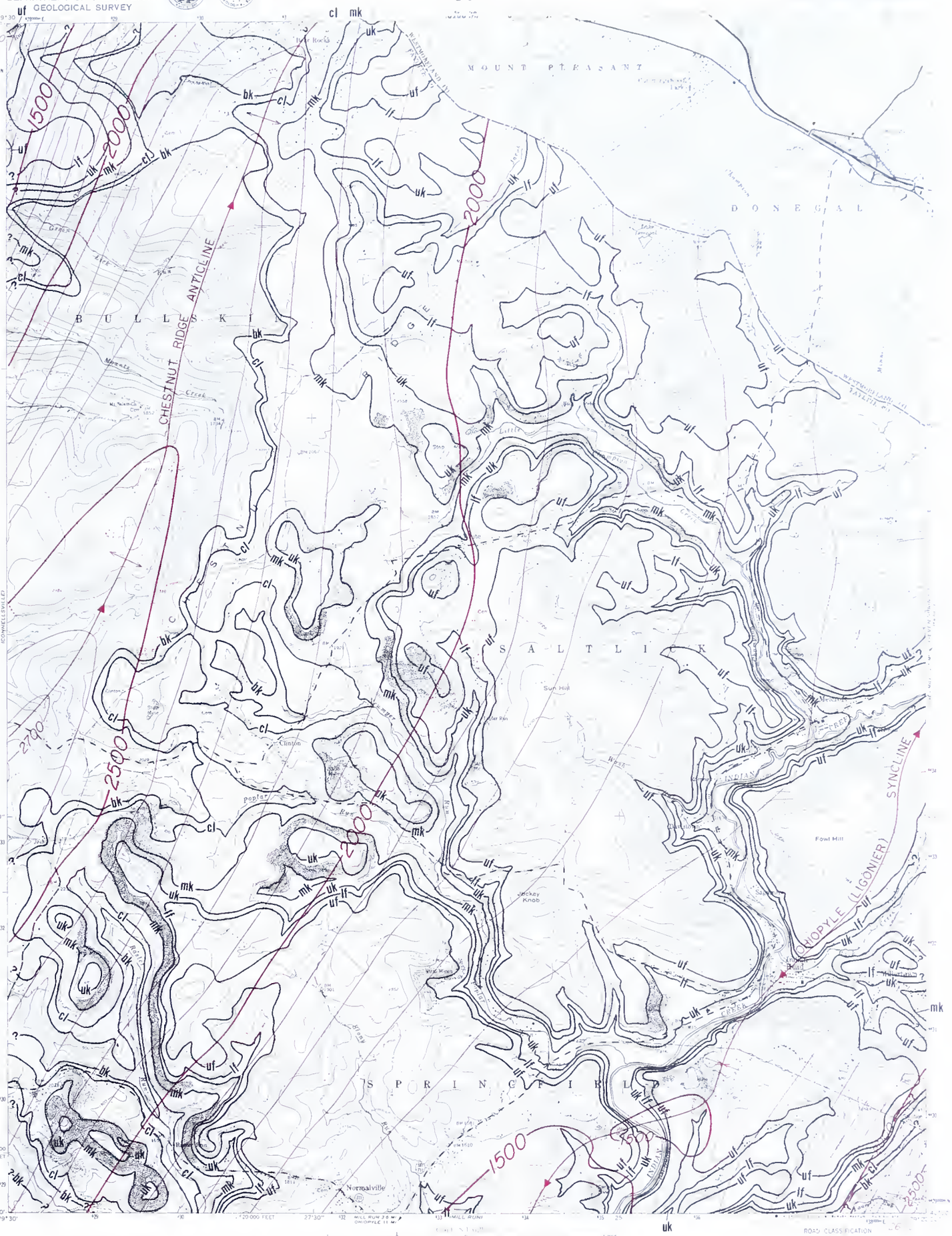
Secondary highway, all weather, hard surface — Unimproved road, fair or dry weather

Interstate Route — State Route

CROP LINE AND MINED-OUT AREAS OF THE UPPER FREEPORT COAL

DONEGAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

CROP LINES

- uf — Upper Freeport coal
- lf — Lower Freeport coal
- uk — Upper Kittanning coal
- mk — Middle Kittanning coal
- cl — Clarion coal
- bk — Brookville coal

Anticline
Showing axial-plane trace and direction of plunge.

Syncline
Showing axial-plane trace and direction of plunge.

Structure contour
Altitude of the top of the Upper Freeport coal, in feet above mean sea level. Contour interval 100 feet.

MAP RELIABILITY

Coal crop lines—fair to very good
Structure contours—fair to very good

SOURCES

Crop lines modified by J. R. Shaulis from Shaffner, M. N. (1963), *Geology and mineral resources of the Donegal quadrangle, Pennsylvania*. Pennsylvania Geological Survey, 4th ser., Atlas 48, 116 p.

Structure contours compiled by J. R. Shaulis from unpublished data and unpublished mine maps, some reference to Shaffner (1963) and unpublished map by W. E. Edmunds (1976)

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Primary highway, all weather, hard surface
Secondary highway, all weather, hard surface
Light-duty road, all weather, improved surface
Unimproved road, fair or dry weather
Interstate Route
State Route

DONEGAL

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Pittsburgh coal

Extent of known deep mining

MAP RELIABILITY

Coal crop line—very good

Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

DONORA

CROP LINE AND MINED-OUT AREA OF THE PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

CROP LINES

—wb— Waynesburg coal

—r— Redstone coal

—p— Pittsburgh coal

Syncline
Showing axial plane trace and direction of plunge.

—700— Structure contour
Altitude of the base of the Pittsburgh coal in feet above mean sea level. Contour interval 20 feet

MAP RELIABILITY

Coal crop lines—good to very good
Structure contours—very good

SOURCES

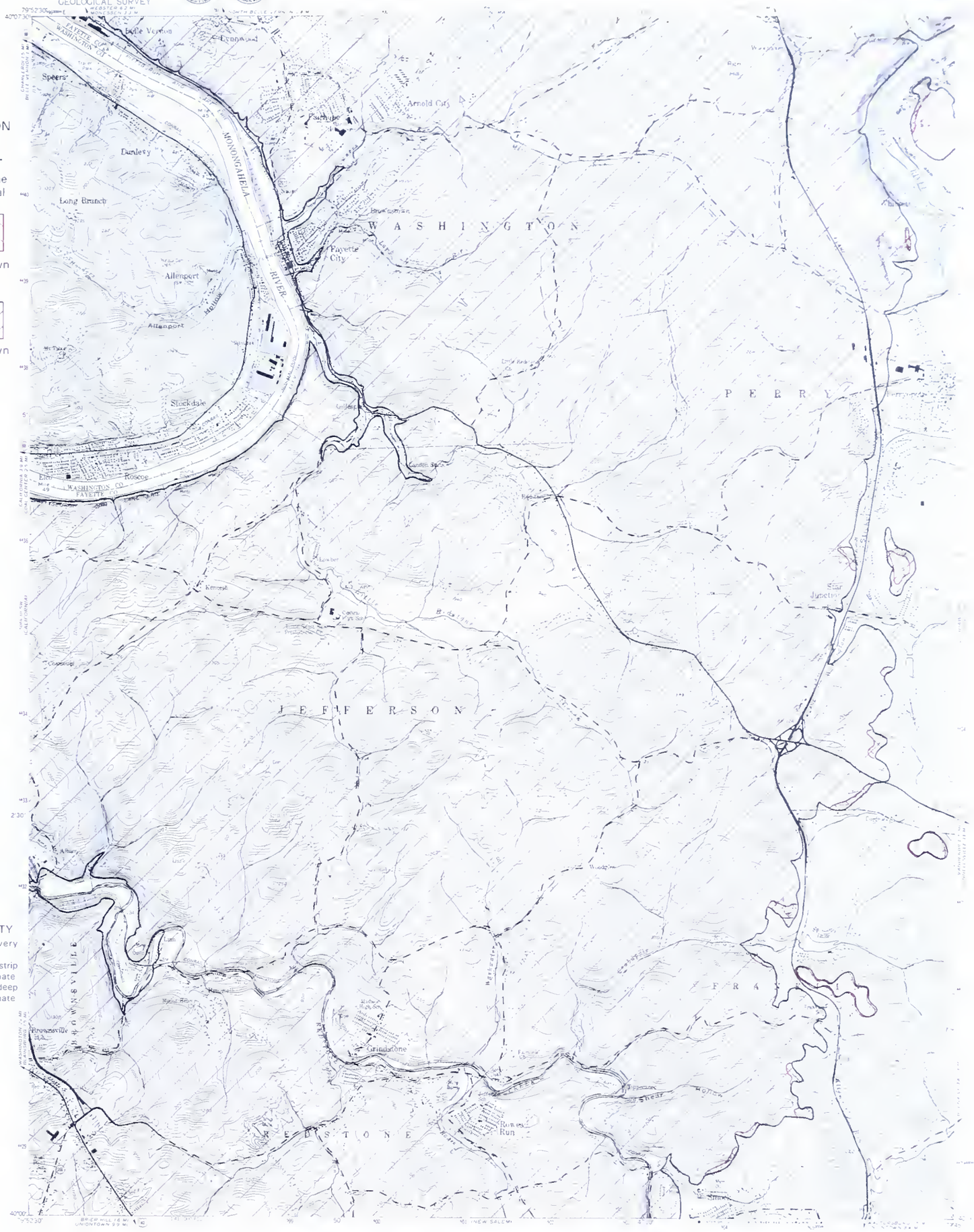
Crop lines slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Structure contours compiled by A. D. Glover (1976) from Hickok and Moyer (1940).

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

DONORA

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

Crop line of the Pittsburgh coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—very good

Limits of known strip mining—approximate

Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map.

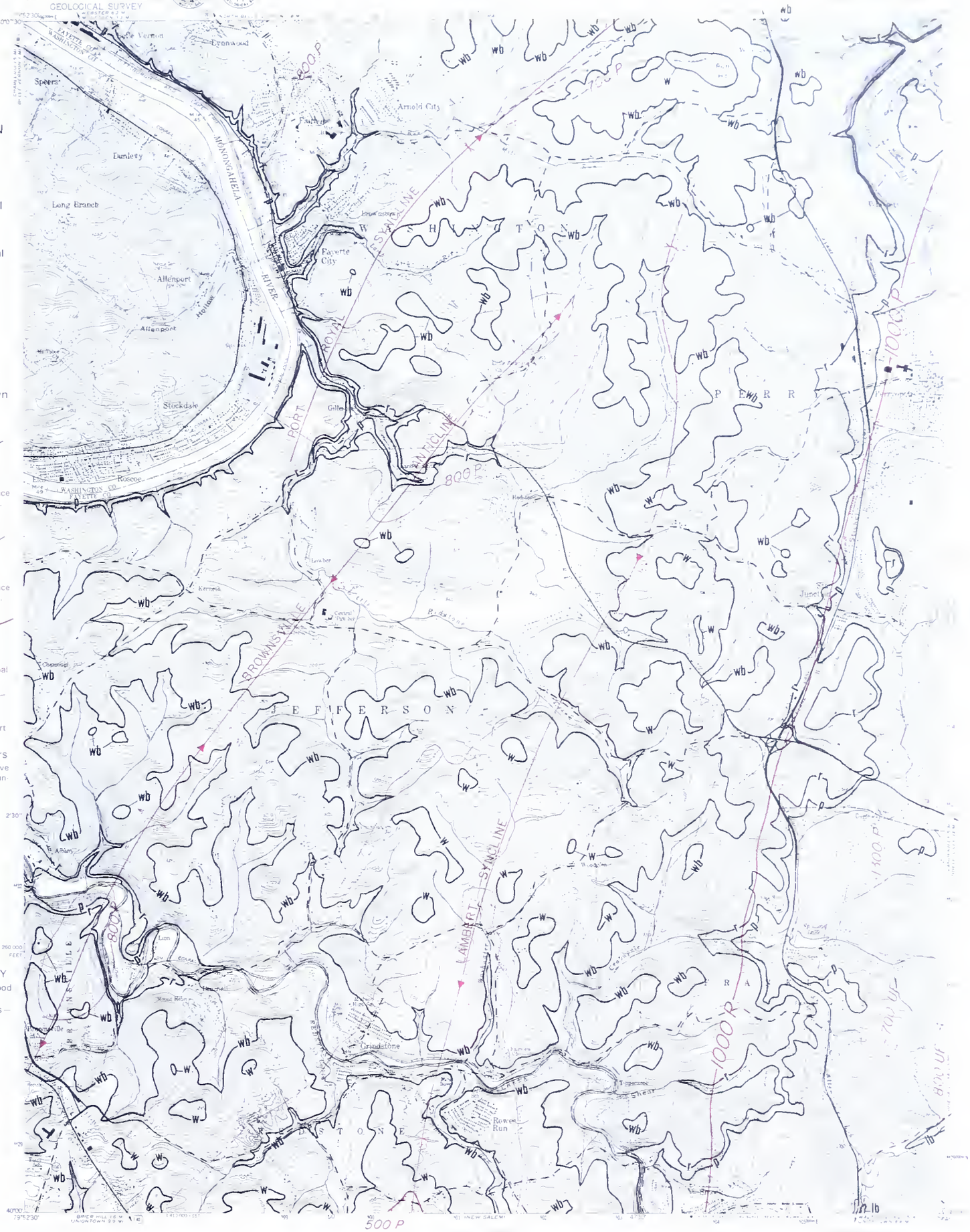
Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

UTM GRID AND 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

FAYETTE CITY

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

CROP LINES

- w — Washington coal
- wb — Waynesburg coal
- r — Redstone coal
- p — Pittsburgh coal
- lb — Lower Bakerstown coal

Anticline
Showing axial-plane trace and direction of plunge.

Syncline
Showing axial-plane trace and direction of plunge.

1000 P — Base of Pittsburgh coal

700 UF — Top of Upper Freeport coal

Structure contours
Altitudes in feet above mean sea level. Contour interval 100 feet

MAP RELIABILITY

Coal crop lines—good to very good
Structure contours—very good

SOURCES

Crop lines slightly modified by J. R. Shaulis from Hickok, W. O. IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Structure contours compiled by A. D. Glover (1976) from Hickok and Moyer (1940).

FAYETTE CITY

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Lower Kittanning coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—fair to good

Limits of known strip mining—approximate

Limits of known deep mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p., and Campbell, M. R. (1902), *Masontown-Uniontown folio, Pennsylvania*, U.S. Geological Survey Geologic Atlas of the U.S. Folio 82, 21 p.

Limits of strip mining based on interpretation of topographic map and on field checking.

Limits of deep mining from E. D'Appolonia Consulting Engineers, Inc. (1975), *Mine drainage abatement survey, Cucumber Run watershed*, Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 138, 16 p.; and unpublished mine maps.

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

FORT NECESSITY

CROP LINE AND MINED-OUT AREAS OF THE LOWER KITTANNING COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Upper Kittanning coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—fair to very good

Limits of known strip mining—approximate

Limits of known deep mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p., and Campbell, M. R. (1902), *Masontown-Uniontown folio, Pennsylvania*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 82, 21 p.

Limits of strip mining based on interpretation of topographic map and on field checking

Limits of deep mining based on unpublished data from Pennsylvania Department of Environmental Resources, Bureau of Forestry

CROP LINE AND MINED-OUT AREAS OF THE

UPPER KITTANNING COAL

FORT NECESSITY

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Upper Freeport coal

Extent of known strip mining

MAP RELIABILITY

Coal crop line—fair to very good

Limits of known strip mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.; and Campbell, M. R. (1902), *Masontown-Uniontown folio, Pennsylvania*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 82, 21 p.

Limits of strip mining based on interpretation of topographic map and on field checking.

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

FORT NECESSITY

CROP LINE AND MINED-OUT AREAS OF THE

UPPER FREEPORT COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

CROP LINES

- lb — Lower Bakerstown coal
- bc — Brush Creek coal
- uf — Upper Freeport coal
- uk — Upper Kittanning coal
- lk — Lower Kittanning coal
- cl — Clarion coal
- bk — Brookville coal

Anticline
Showing axial-plane trace and direction of plunge.

Syncline
Showing axial-plane trace and direction of plunge.

—2000 UF— Top of Upper Freeport coal

—1900 B— Top of Burgoon Sandstone

Structure contours
Altitudes in feet above mean sea level. Contour interval 100 feet.

MAP RELIABILITY

Coal crop lines—fair to very good
Structure contours—fair to very good

SOURCES

Crop lines compiled by J. R. Shaulis from unpublished data. Minor reference to Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.; and Campbell, M. R. (1902), *Masontown-Uniontown folio, Pennsylvania*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 82, 21 p.
Structure contours compiled by J. R. Shaulis from unpublished data; minor reference to Hickok and Moyer (1940) and Campbell (1902).

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
U. S. Route — State Route

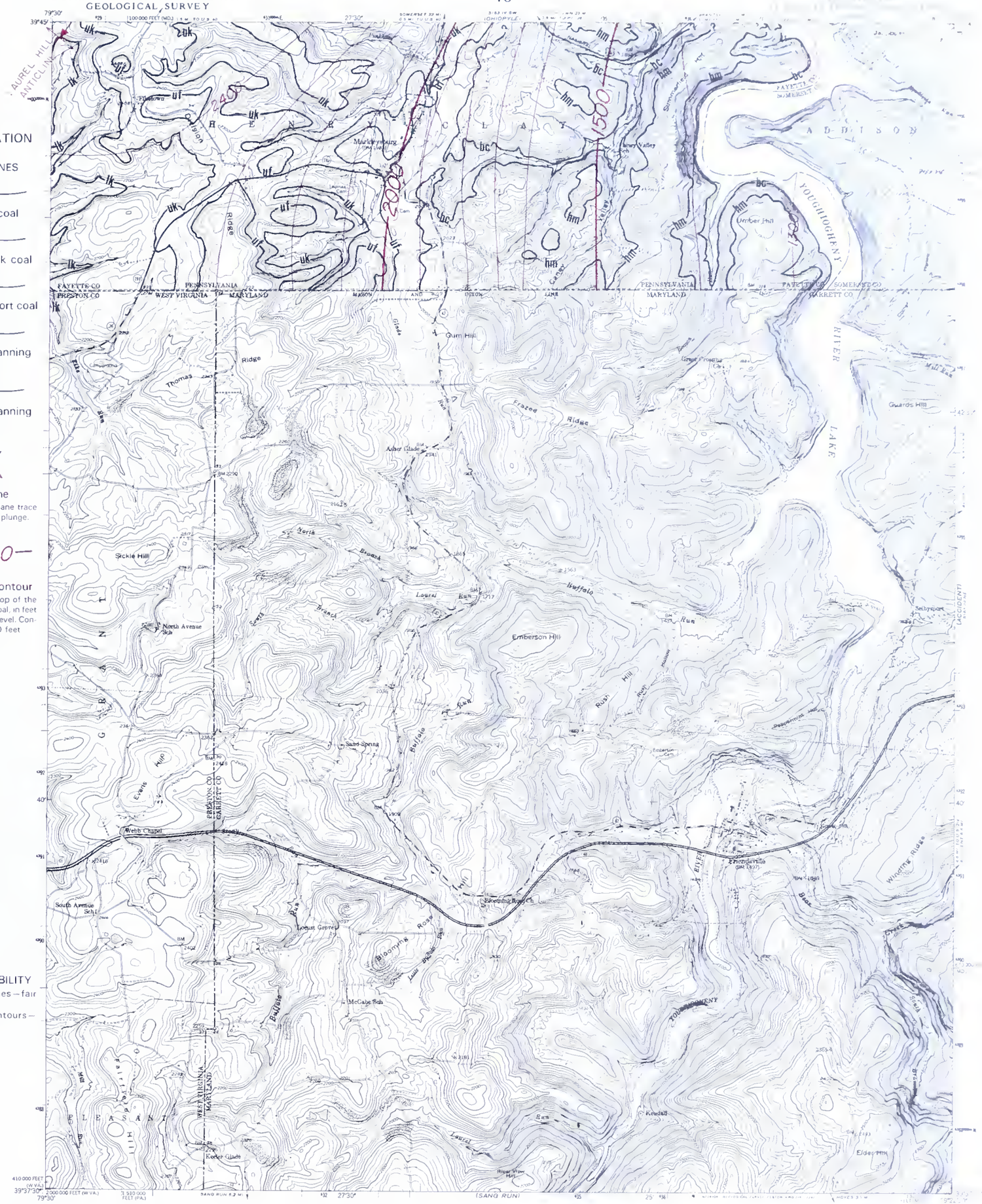
UTM GRID AND 1973 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

PENNSYLVANIA
QUADRANGLE LOCATION

FORT NECESSITY

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

CROP LINES

—hm— Harlem coal

—bc— Brush Creek coal

—uf— Upper Freeport coal

—uk— Upper Kittanning coal

—lk— Lower Kittanning coal

Anticline
Showing axial-plane trace and direction of plunge.

—2000— **Structure contour**
Altitude of the top of the Upper Freeport coal, in feet above mean sea level. Contour interval 100 feet

MAP RELIABILITY

Coal crop lines—fair to good
Structure contours—fair to good

SOURCES

Crop lines modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.; and Jacobsen, E. F., and Lyons, P. C. (in preparation), *Coal geology of the Lower Youghiogheny coal field, Garrett County, Maryland*, U.S. Geological Survey.

Structure contours compiled by J. R. Shaulis from unpublished data; minor reference to Hickok and Moyer (1940) and Jacobsen and Lyons (in preparation).

SCALE 1:62,500

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Heavy duty — Light duty
Medium duty — Unimproved dirt
Interstate Route — U.S. Route — State Route

COAL CROP LINES AND STRUCTURE CONTOURS

FRIENDSVILLE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Anticline
Showing axial-plane trace and direction of plunge

Structure contour
Altitude of the top of the Upper Freeport coal, in feet above mean sea level. Contour interval 100 feet.

MAP RELIABILITY

Structure contours—fair

SOURCES

Structure contours compiled by J. R. Shaulis from unpublished data; minor reference to Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Primary highway, all weather, hard surface
Secondary highway, all weather, hard surface
Light duty road, all weather, improved surface
Unimproved road, fair or dry weather
State Route

KINGWOOD

STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map and on field checking.

LAKE LYNN

CROP LINE AND MINED-OUT AREA OF THE LOWER FREEPORT COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Upper Freeport coal

Extent of known strip mining

MAP RELIABILITY

Coal crop line—fair to good

Limits of known strip mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map and on field checking

LAKE LYNN

CROP LINE AND MINED-OUT AREAS OF THE

UPPER FREEPORT COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Pittsburgh coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY
Coal crop line—very good
Limits of known strip mining—approximate
Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

LAKE LYNN

CROP LINE AND MINED-OUT AREAS OF THE
PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Redstone coal

Extent of known strip mining

MAP RELIABILITY
Coal crop line—good
Limits of known strip mining—approximate

SOURCES

Crop line slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.

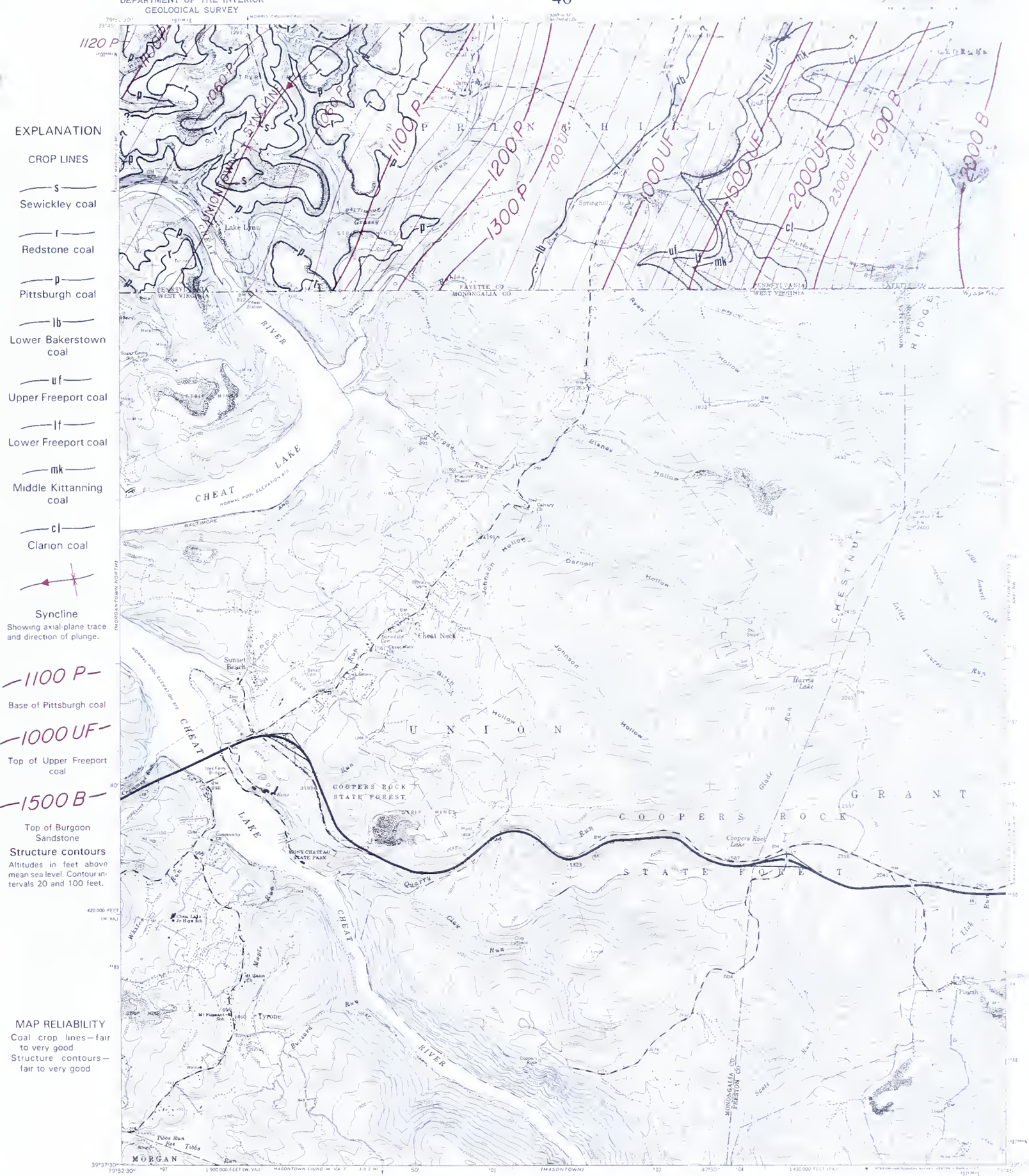
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

LAKE LYNN

CROP LINE AND MINED-OUT AREAS OF THE

REDSTONE COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



SOURCES

Crop lines modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Structure contours on top of Upper Freeport coal compiled by J. R. Shaulis from unpublished data, minor reference to Hickok and Moyer (1940) and unpublished map by W. E. Edmunds (1976). Structure contours on base of Pittsburgh coal compiled by A. D. Glover (1976) from Hickok and Moyer (1940).

COAL CROP LINES AND STRUCTURE CONTOURS

LAKE LYNN

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

CROP LINES

—uf— Upper Freeport coal

—lf— Lower Freeport coal

—mk— Middle Kittanning coal

—lk— Lower Kittanning coal

—bk— Brookville coal

Anticline
Showing axial-plane trace and direction of plunge.

—2000— Structure contour
Altitude of the top of the Upper Freeport coal, in feet above mean sea level. Contour interval 100 feet.

MAP RELIABILITY

Coal crop lines—fair
Structure contours—fair

SOURCES

Crop lines modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Structure contours compiled by J. R. Shaulis from unpublished data; minor reference to Hickok and Moyer (1940) and unpublished map by W. E. Edmunds (1976).

MAMMOTH

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Pittsburgh coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—very good

Limits of known strip mining—approximate

Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

MASONTOWN

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SOURCES

Crop line slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.

MASONTOWN

CROP LINE AND MINED-OUT AREAS OF THE REDSTONE COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Sewickley coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—good
Limits of known strip mining—approximate
Limits of known deep mining—approximate

SOURCES

Crop line slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.
Limits of deep mining from unpublished mine maps.

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

CROP LINE AND MINED-OUT AREAS OF THE SEWICKLEY COAL

MASONTOWN

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Waynesburg coal

Extent of known strip mining

MAP RELIABILITY

Coal crop line—good
Limits of known strip mining—approximate

SOURCES

Crop line slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.

SCALE 1:62500

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1975 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

MASONTOWN

CROP LINE AND MINED-OUT AREAS OF THE

WAYNESBURG COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

CROP LINES

- W — Waynesburg coal
- S — Sewickley coal
- r — Redstone coal
- p — Pittsburgh coal

Anticline
Showing axial-plane trace and direction of plunge.

Syncline
Showing axial-plane trace and direction of plunge

Structure contour
Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

MAP RELIABILITY

Coal crop lines—good to very good
Structure contours—very good

SOURCES

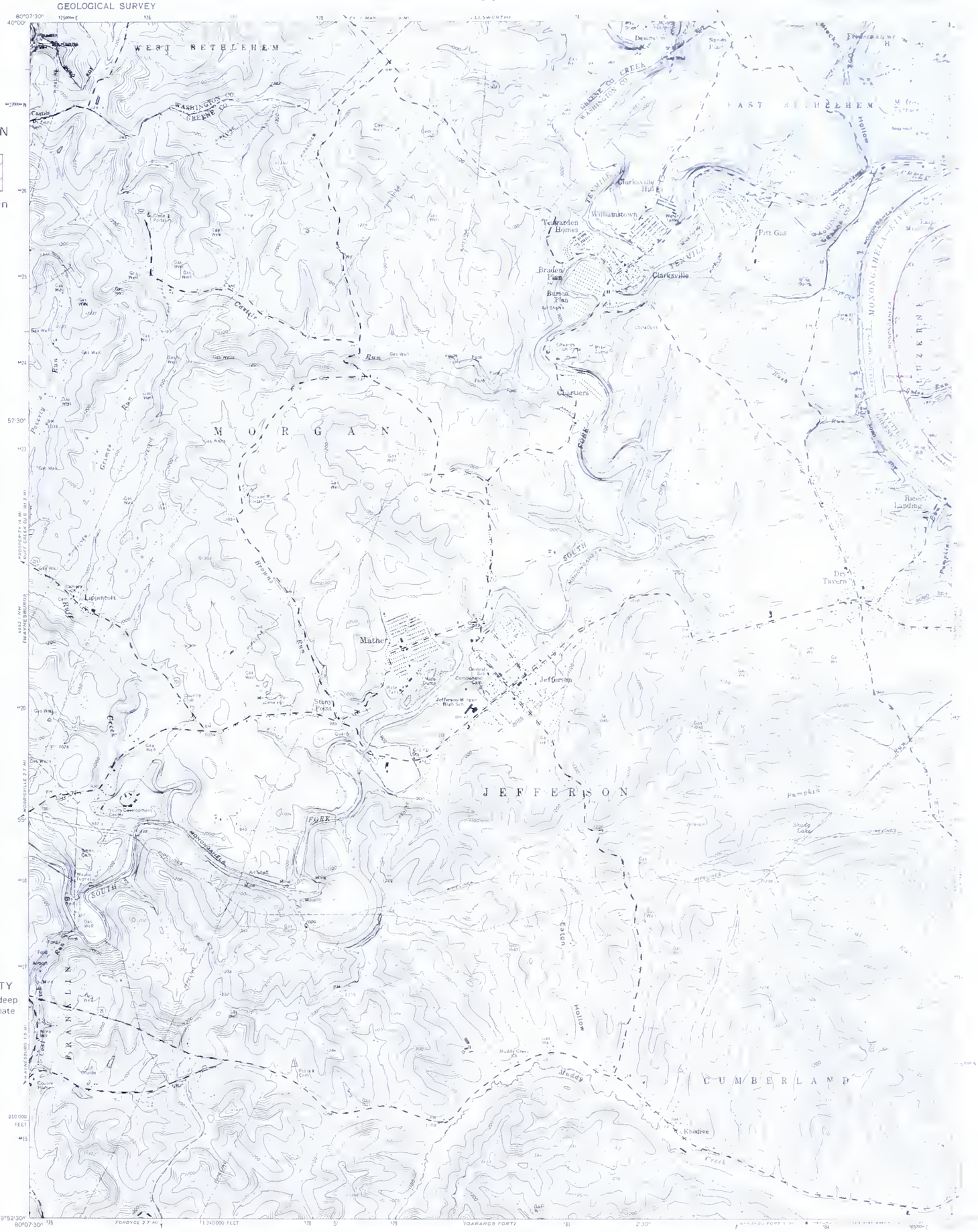
Crop lines slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p. Structure contours compiled by A. D. Glover (1976) from Hickok and Moyer (1940) and Kent, B. H. (1973), *Geologic map of parts of the Masontown and Morgantown North quadrangles, Greene County, Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I–743, scale 1:24,000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

COAL CROP LINES AND STRUCTURE CONTOURS

MASONTOWN

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

Extent of known deep mining

MAP RELIABILITY

Limits of known deep mining—approximate

SOURCE

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

MATHER

MINED-OUT AREA OF THE PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Waynesburg coal

MAP RELIABILITY

Coal crop line—good

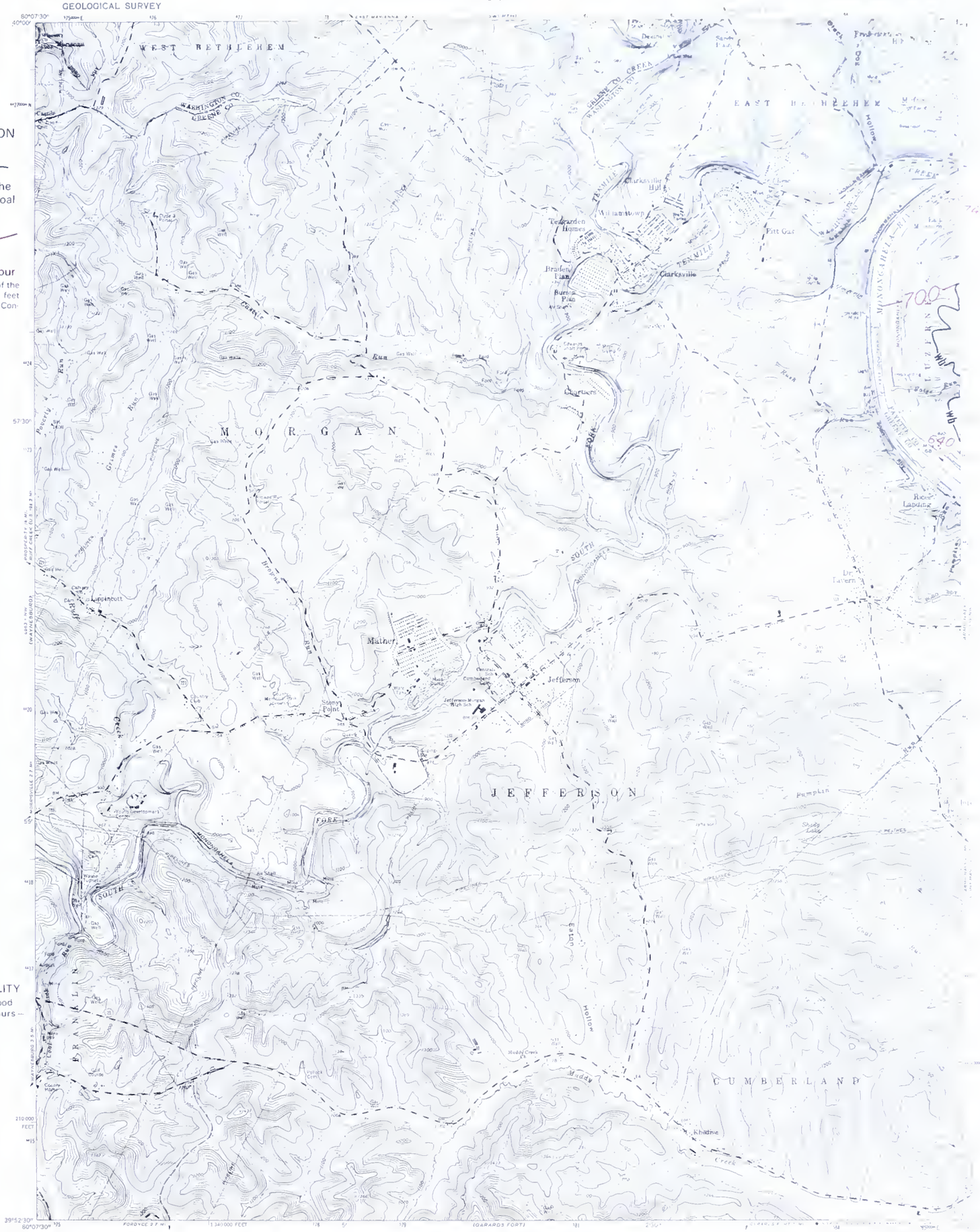
SOURCE

Crop line slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

MATHER

CROP LINE OF THE
WAYNESBURG COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

Crop line of the Waynesburg coal

700

Structure contour

Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

MAP RELIABILITY

Coal crop line—good
Structure contours—very good

SOURCES

Crop line slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Structure contours compiled by A. D. Glover (1976) from Hickok and Moyer (1940) and Kent, B. H. (1969), *Geologic map of the Mather quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-826, scale 1:24,000.

SCALE 1:12,500

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

UTM GRID AND 1972 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

MATHER

COAL CROP LINE AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map and on field checking.
Limits of deep mining from unpublished mine maps.

MILL RUN

CROP LINE AND MINED-OUT AREAS OF THE LOWER KITTANNING COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Lower Freeport coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—poor to good

Limits of known strip mining—approximate

Limits of known deep mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map and on field checking

Limits of deep mining from unpublished mine maps.

MILL RUN

CROP LINE AND MINED-OUT AREAS OF THE
LOWER FREEPORT COAL

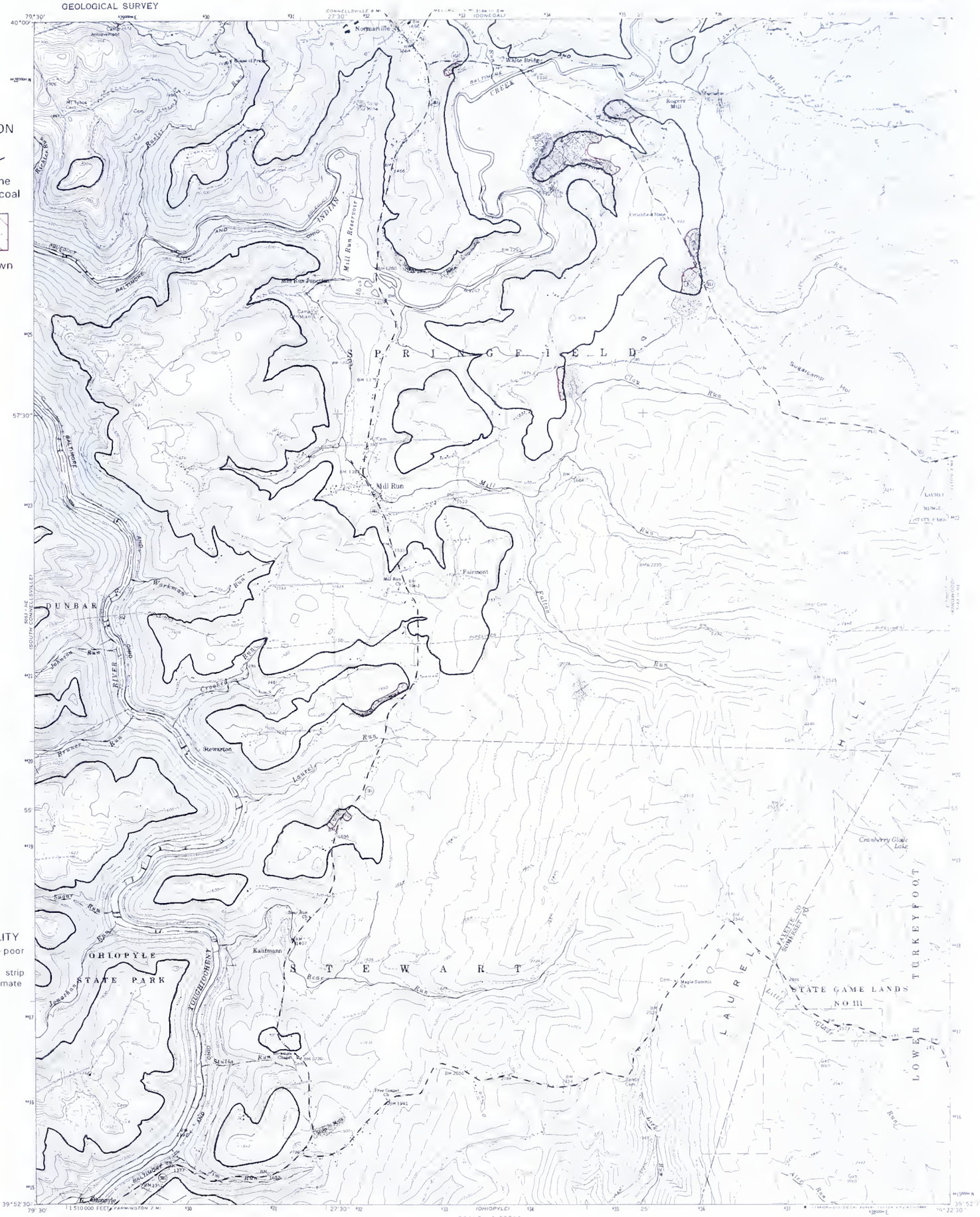
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MILL RUN QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

EXPLANATION

Crop line of the Upper Freeport coal

Extent of known strip mining



MAP RELIABILITY

Coal crop line—poor to good

Limits of known strip mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map and on field checking.

SCALE ~1:62500

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1980 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

ROAD CLASSIFICATION

Secondary highway, all weather, hard surface — Light-duty road, all weather, improved surface

Unimproved road, fair or dry weather

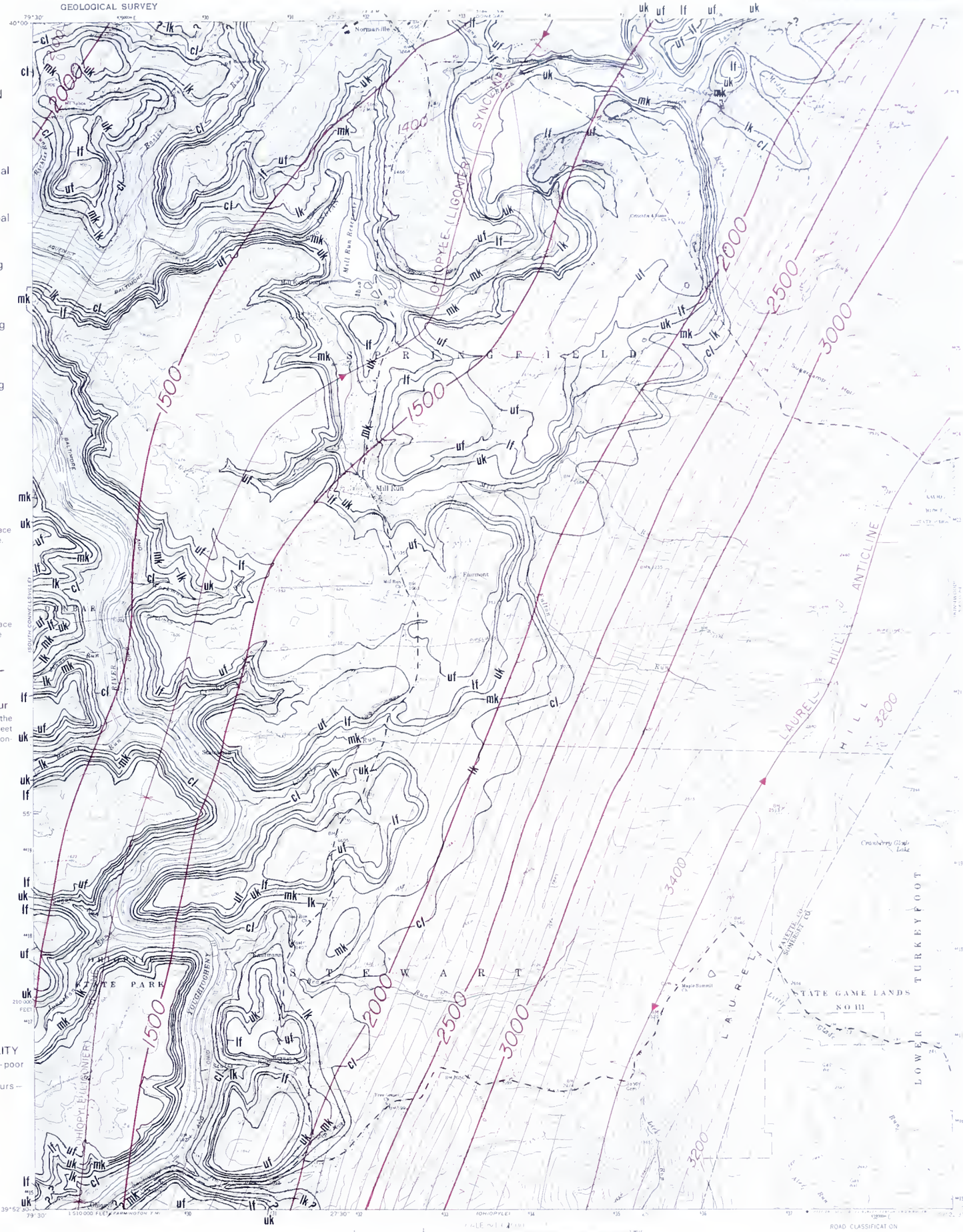
State Route

PENNSYLVANIA
QUADRANGLE LOCATION

MILL RUN

CROP LINE AND MINED-OUT AREAS OF THE UPPER FREEPORT COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

CROP LINES

uf — Upper Freeport coal

lf — Lower Freeport coal

uk — Upper Kittanning coal

mk — Middle Kittanning coal

lk — Lower Kittanning coal

cl — Clarion coal

Anticline
Showing axial-plane trace and direction of plunge.

Syncline
Showing axial-plane trace and direction of plunge

2000
Structure contour
Altitude of the top of the Upper Freeport coal, in feet above mean sea level. Contour interval 100 feet.

MAP RELIABILITY
Coal crop lines—poor to good
Structure contours—poor to good

SOURCES

Crop lines modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Structure contours compiled by J. R. Shaulis from unpublished data. Minor reference to Hickok and Moyer (1940); Shaffner, M. N. (1963), *Geology and mineral resources of the Donegal quadrangle, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., Atlas 48, 116 p.; and unpublished map by W. E. Edmunds (1976).

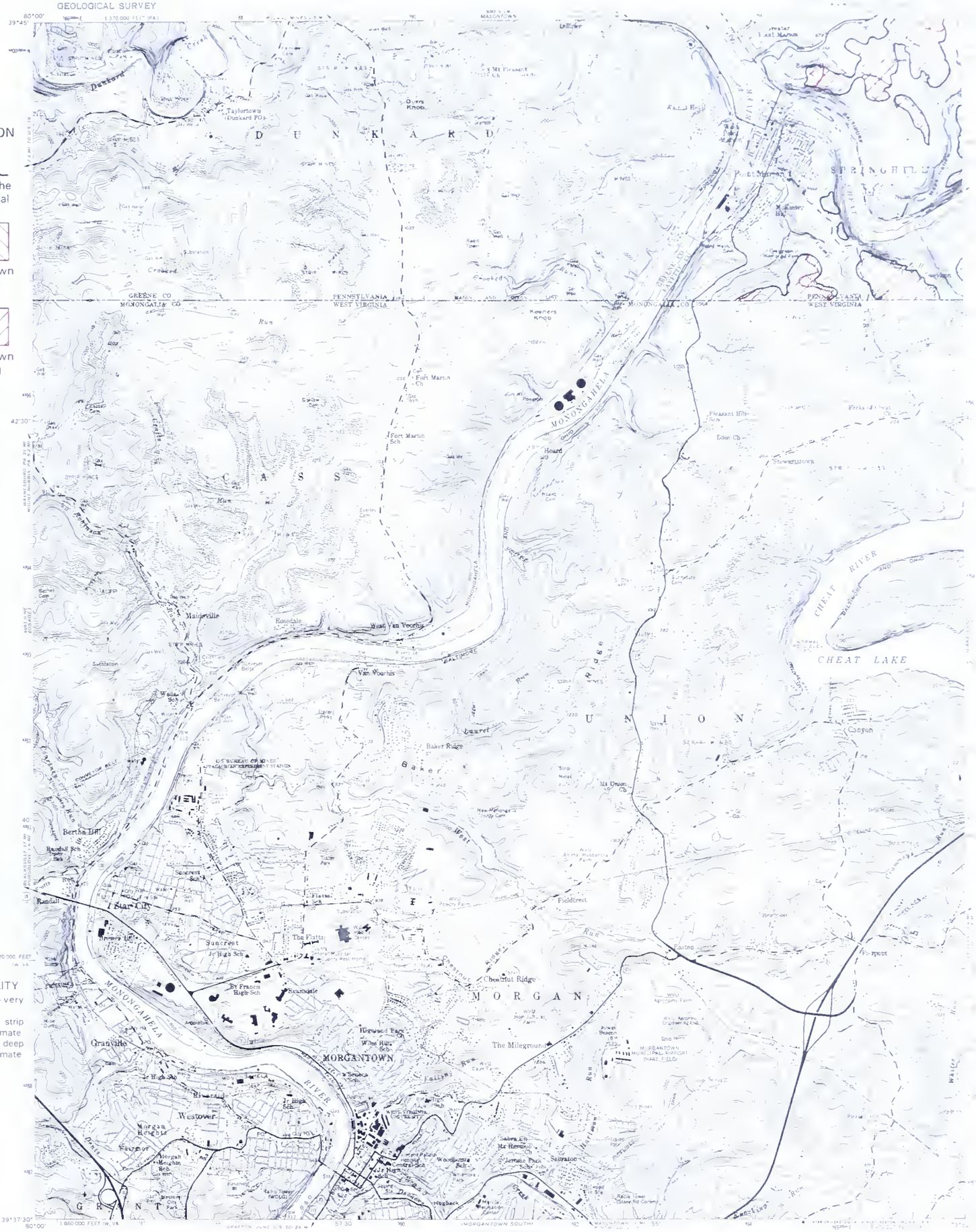
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Secondary highway, all weather, hard surface — Light duty road, all weather, improved surface — Unimproved road, fair or dry weather — State Route

COAL CROP LINES AND STRUCTURE CONTOURS

MILL RUN

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

Crop line of the Pittsburgh coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—very good

Limits of known strip mining—approximate

Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1975 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

MORGANTOWN NORTH

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Structure contours compiled by A. D. Glover (1976) from Hickok and Moyer (1940) and Kent, B. H. (1973), *Geologic map of parts of the Masontown and Morgantown North quadrangles, Greene County, Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I–743, scale 1:24,000.

COAL CROP LINE AND STRUCTURE CONTOURS

MORGANTOWN NORTH

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

1000

Structure contour
Altitude of the top of the Upper Freeport coal, in feet above mean sea level. Contour interval 100 feet

MAP RELIABILITY
Structure contours—poor to fair

SOURCE
Structure contours modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

SCALE ~1:62500

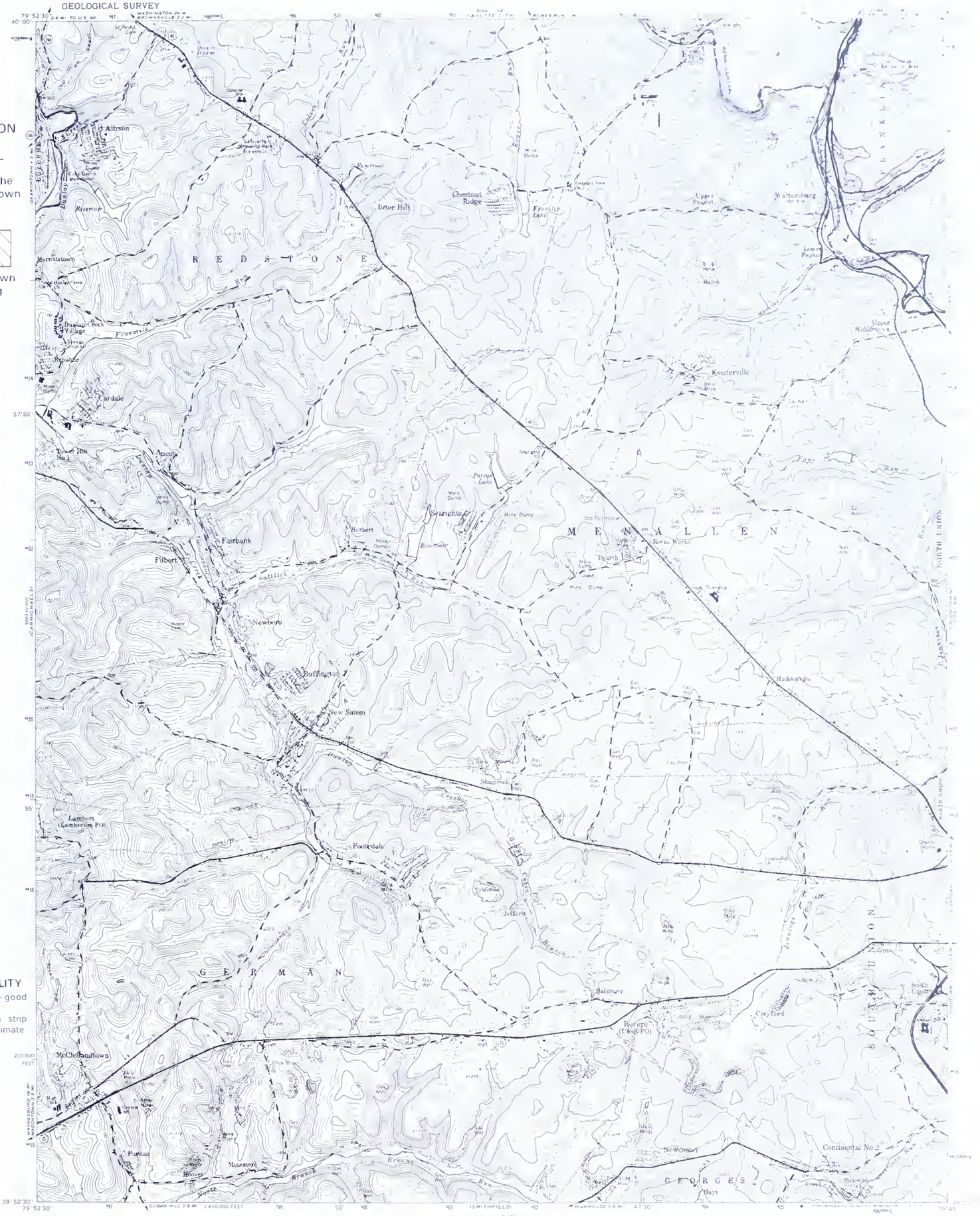
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

UTM GRID AND 1972 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

MOUNT PLEASANT

STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



SOURCES

Crop line compiled by J. R. Shaulis from unpublished data; minor reference to Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p. Limits of strip mining based on interpretation of topographic map and on field checking

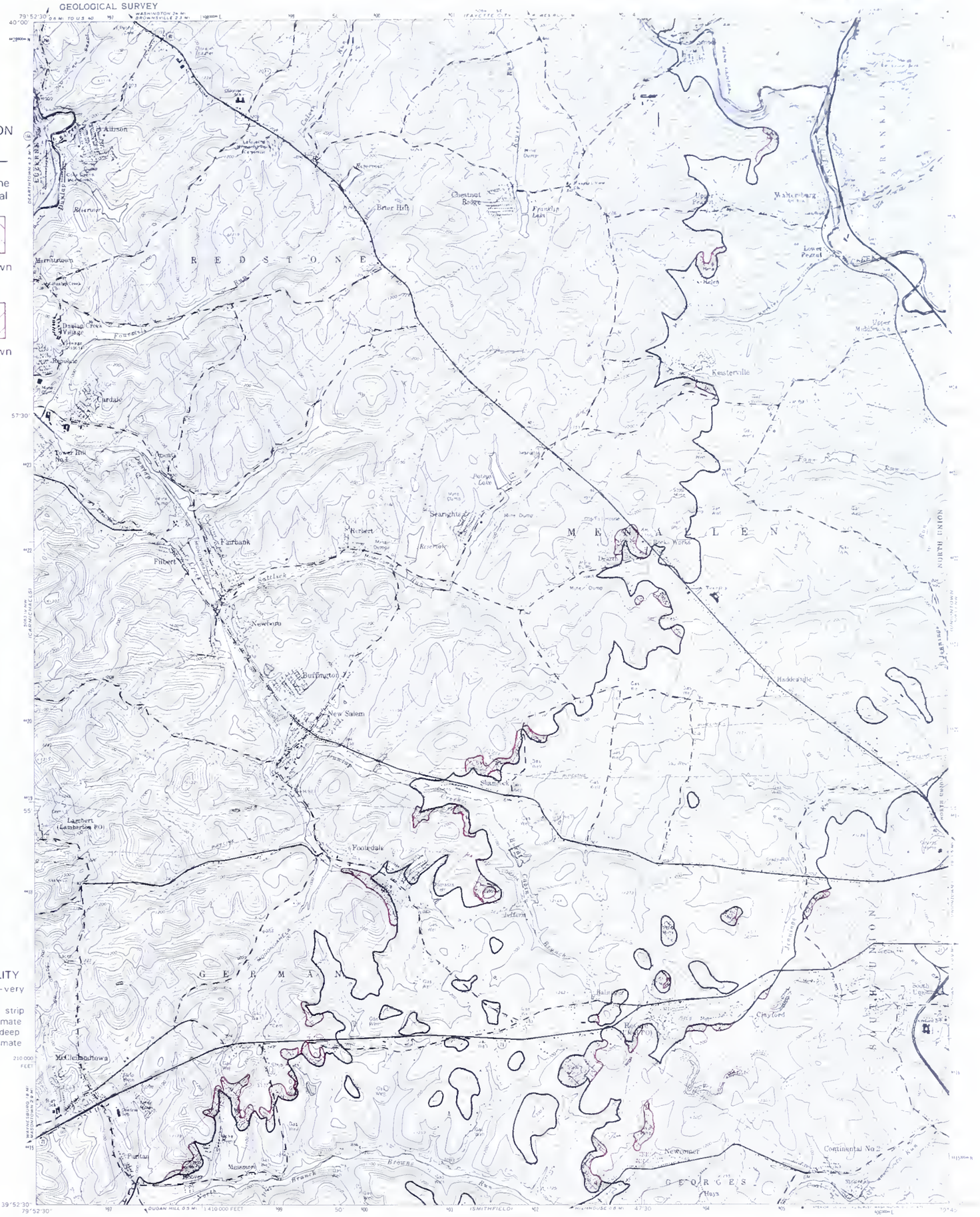
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Heavy duty — Light duty
Medium duty — Unimproved dirt
U.S. Route — State Route

NEW SALEM

CROP LINE AND MINED-OUT AREAS OF THE LOWER BAKERSTOWN COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

Crop line of the Pittsburgh coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—very good

Limits of known strip mining—approximate

Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

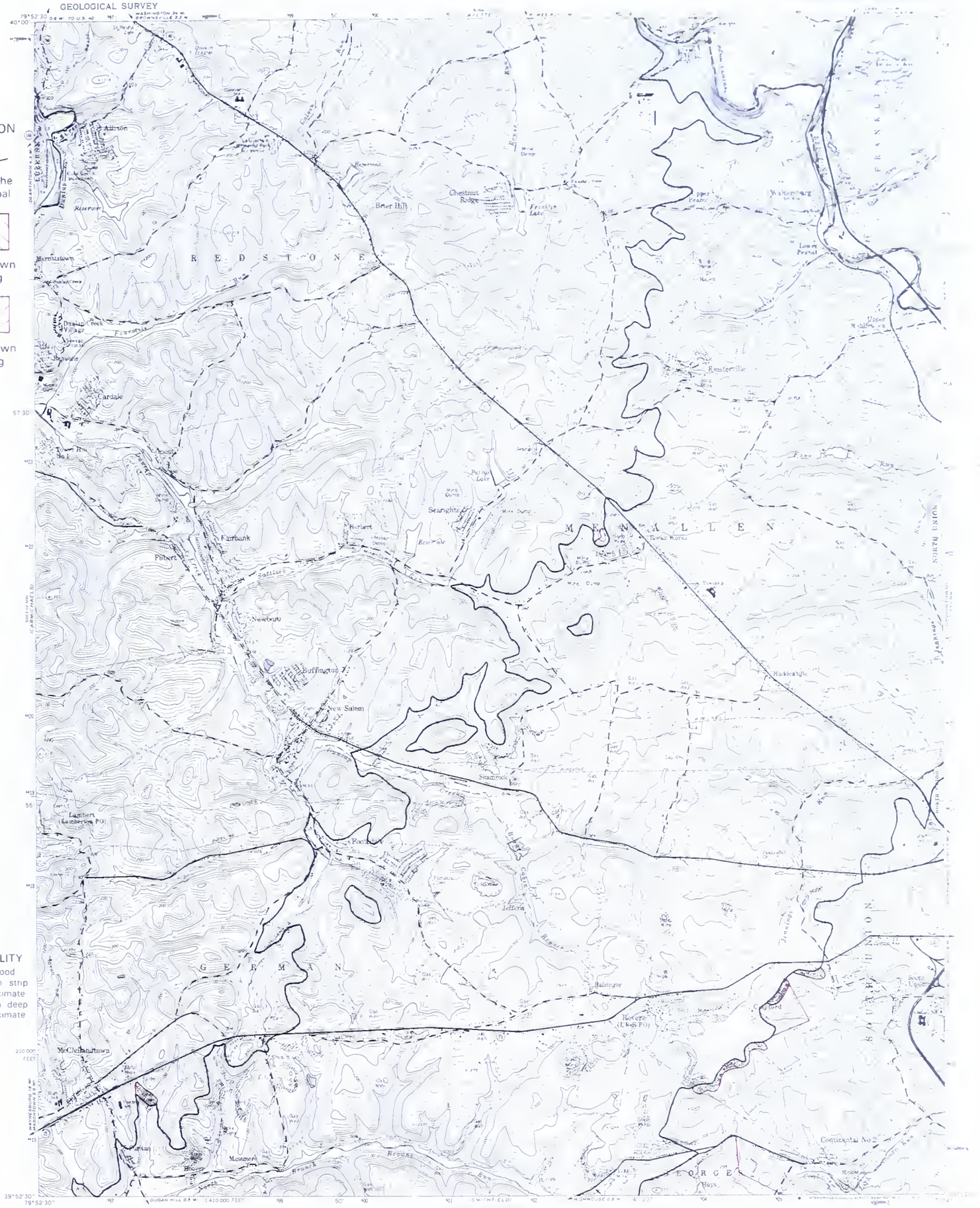
SCALE 1:62 500

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

NEW SALEM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

Crop line of the Sewickley coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—good
Limits of known strip mining—approximate
Limits of known deep mining—approximate

SOURCES

Crop line slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.
Limits of deep mining from unpublished mine maps.

UTM GRID AND 1973 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

NEW SALEM

CROP LINE AND MINED-OUT AREAS OF THE SEWICKLEY COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

CROP LINES

— w — Washington coal

— wb — Waynesburg coal

— s — Sewickley coal

— r — Redstone coal

— p — Pittsburgh coal

— lb — Lower Bakerstown coal

Anticline
Showing axial-plane trace and direction of plunge

Syncline
Showing axial-plane trace and direction of plunge

—500 P— Base of Pittsburgh coal

—700 UF— Top of Upper Freeport coal

Structure contours
Altitudes in feet above mean sea level. Contour interval 100 feet

MAP RELIABILITY

Coal crop lines—good to very good
Structure contours—good to very good

SOURCES

Crop lines slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Structure contours compiled by A. D. Glover (1976) from Hickok and Moyer (1940).

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Heavy duty — Light duty
Medium duty — Unimproved dirt
U.S. Route — State Route

NEW SALEM

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map and on field checking.

OHIOPYLE

CROP LINE AND MINED-OUT AREAS OF THE LOWER KITTANNING COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Upper Kittanning coal

Extent of known deep mining

MAP RELIABILITY
Coal crop line – poor
Limits of known deep mining – approximate

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of deep mining from unpublished mine maps.

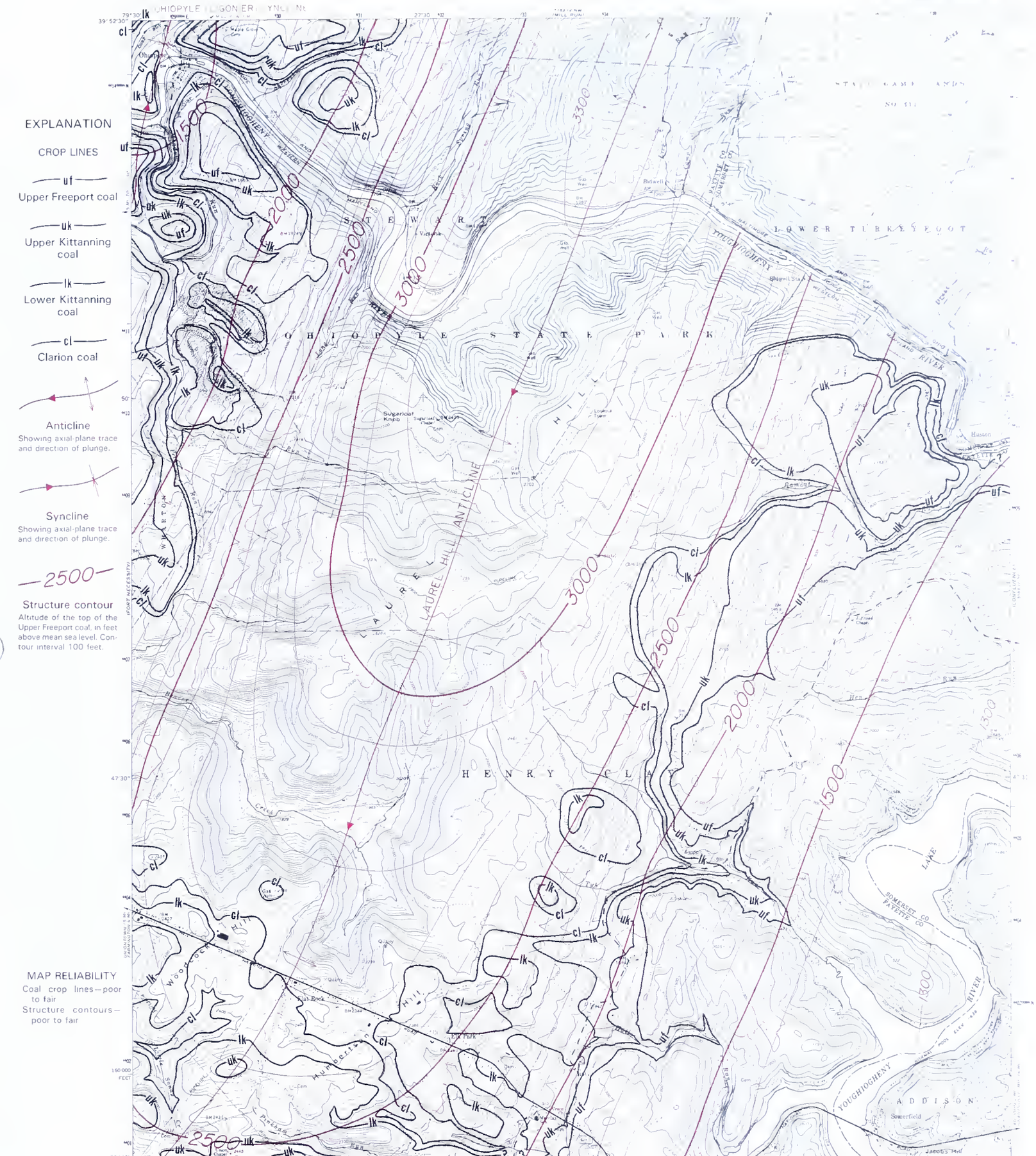
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

OHIOPYLE

CROP LINE AND MINED-OUT AREA OF THE

UPPER KITTANNING COAL



OHIOPYLE

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Middle Kittanning coal

Extent of known deep mining

MAP RELIABILITY

Coal crop line—fair to good

Limits of known deep mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Shaffner, M. N. (1963), *Geology and mineral resources of the Donegal quadrangle, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., Atlas 48, 116 p.

Limits of deep mining from Shaffner (1963) and unpublished mine maps.

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, all weather, hard surface — Light-duty road, all weather, improved surface

Secondary highway, all weather, hard surface — Unimproved road, fair or dry weather

Interstate Route — State Route

SEVEN SPRINGS

CROP LINE AND MINED-OUT AREA OF THE

MIDDLE KITTANNING COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SOURCES

Crop line modified by J. R. Shaulis from Shaffner, M. N. (1963), *Geology and mineral resources of the Donegal quadrangle, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., Atlas 48, 116 p.

Limits of strip mining based on interpretation of topographic map.

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, all weather, hard surface — Light-duty road, all weather, improved surface
Secondary highway, all weather, hard surface — Unimproved road, fair or dry weather
Interstate Route — State Route

SEVEN SPRINGS

CROP LINE AND MINED-OUT AREA OF THE

UPPER FREEPORT COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

CROP LINES

—uf— Upper Freeport coal

—uk— Upper Kittanning coal

—mk— Middle Kittanning coal

—bk— Brookville coal

Syncline
Showing axial-plane trace and direction of plunge.

-2000- Structure contour
Altitude of the top of the Upper Freeport coal, in feet above mean sea level. Contour interval 100 feet

MAP RELIABILITY

Coal crop lines—fair to good
Structure contours—fair to good

SOURCES

Crop lines modified by J. R. Shaulis from Shaffner, M. N. (1963), *Geology and mineral resources of the Donegal quadrangle, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., Atlas 48, 116 p.

Structure contours compiled by J. R. Shaulis from unpublished data, minor reference to Shaffner (1963) and unpublished map by W. E. Edmunds (1976).

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, all weather, hard surface — Light duty road, all weather, improved surface
Secondary highway, all weather, hard surface — Unimproved road, fair to dry weather
Interstate Route — State Route

COAL CROP LINES AND STRUCTURE CONTOURS

SEVEN SPRINGS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Upper Freeport coal

Extent of known strip mining

MAP RELIABILITY

Coal crop line—fair

Limits of known strip mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map and on field checking

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

SMITHFIELD

CROP LINE AND MINED-OUT AREAS OF THE

UPPER FREEPORT COAL

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.
Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

ROAD CLASSIFICATION

SMITHFIELD

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Redstone coal

Extent of known strip mining

MAP RELIABILITY

Coal crop line—good
Limits of known strip mining—approximate

SOURCES

Crop line slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

ROAD CLASSIFICATION

Light-duty
Unimproved dirt
U.S. Route

SMITHFIELD

CROP LINE AND MINED-OUT AREAS OF THE

REDSTONE COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Sewickley coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—good
Limits of known strip mining—approximate
Limits of known deep mining—approximate

SOURCES

Crop line slightly modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.
Limits of deep mining from unpublished mine maps.

SMITHFIELD

CROP LINE AND MINED-OUT AREAS OF THE

SEWICKLEY COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

CROP LINES

- wb — Waynesburg coal
- s — Sewickley coal
- r — Redstone coal
- p — Pittsburgh coal
- uf — Upper Freeport coal
- lf — Lower Freeport coal
- uk — Upper Kittanning coal
- lk — Lower Kittanning coal
- bk — Brookville coal

Anticline
Showing axial-plane trace and direction of plunge.

Syncline
Showing axial-plane trace and direction of plunge

1000 P — Base of Pittsburgh coal

2000 UF — Top of Upper Freeport coal

1500 B — Top of Burgoon Sandstone

Structure contours
Altitudes in feet above mean sea level. Contour interval 100 feet.

MAP RELIABILITY
Coal crop lines—fair to very good
Structure contours—fair to very good

SOURCES

Crop lines modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Structure contours on top of Upper Freeport coal compiled by J. R. Shaulis from unpublished data, minor reference to Hickok and Moyer (1940) and unpublished map by W. E. Edmunds (1976). Structure contours on base of Pittsburgh coal compiled by A. D. Glover (1976) from Hickok and Moyer (1940).

UTM GRID AND 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Light-duty
Unimproved dirt
U.S. Route

SMITHFIELD

COAL CROP LINES AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Pittsburgh coal

Extent of known deep mining

MAP RELIABILITY

Coal crop line—very good

Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

CONTOUR INTERVAL 20 FEET

SMITHTON

CROP LINE AND MINED-OUT AREA OF THE

PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Pittsburgh coal

Structure contour
Altitude of the base of the Pittsburgh coal in feet above mean sea level.

MAP RELIABILITY
Coal crop line—very good
Structure contour—very good

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*: Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Structure contours compiled by A. D. Glover (1976) from Hickok and Moyer (1940).

SMITHTON

COAL CROP LINE AND STRUCTURE CONTOURS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Clarion coal

Extent of known strip mining

MAP RELIABILITY

Coal crop line – fair
Limits of known strip mining – approximate

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map and on field checking

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

CROP LINE AND MINED-OUT AREAS OF THE CLARION COAL

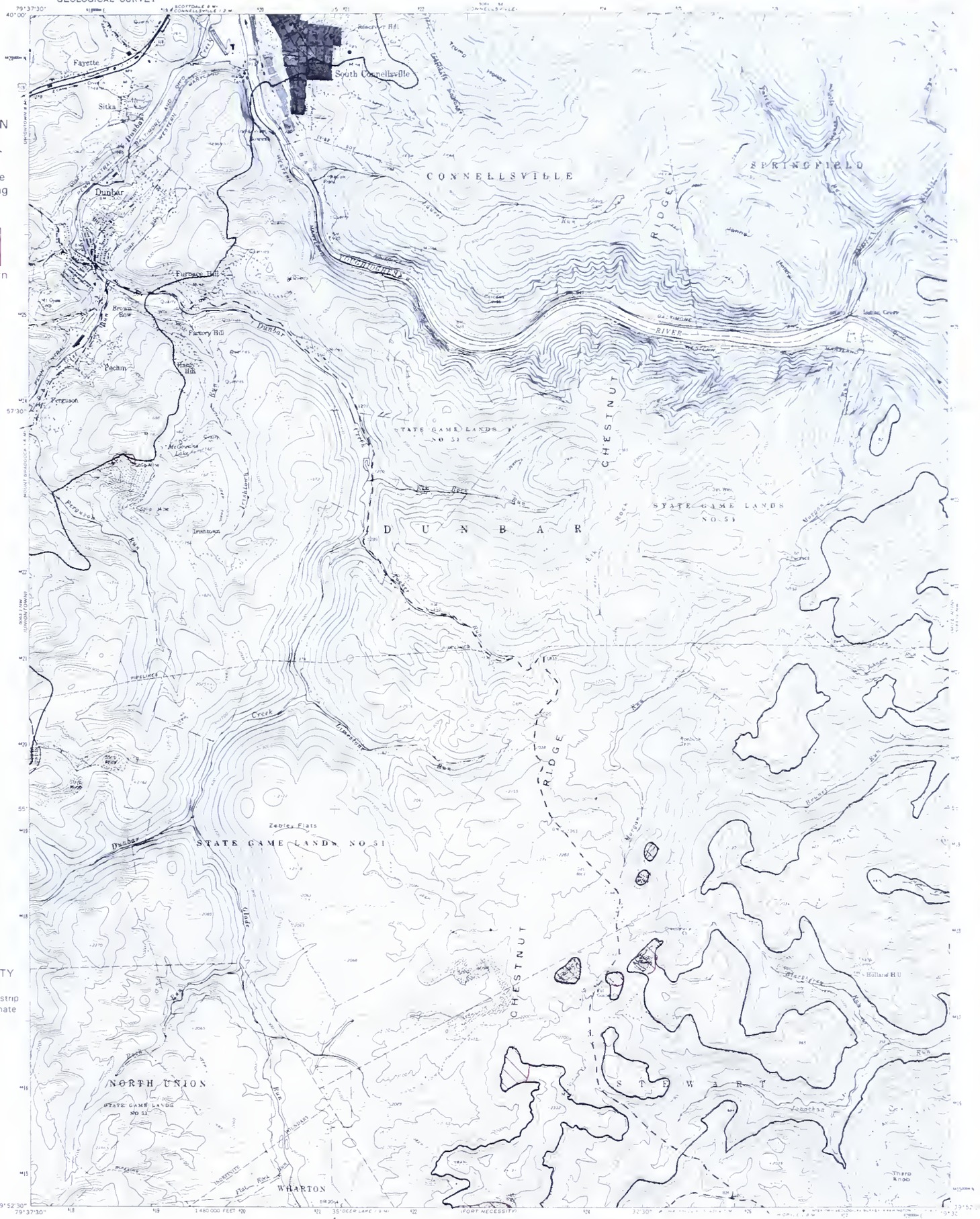
SOUTH CONNELLSVILLE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Upper Kittanning coal

Extent of known strip mining



MAP RELIABILITY

Coal crop line—fair
Limits of known strip mining—approximate

SOURCES

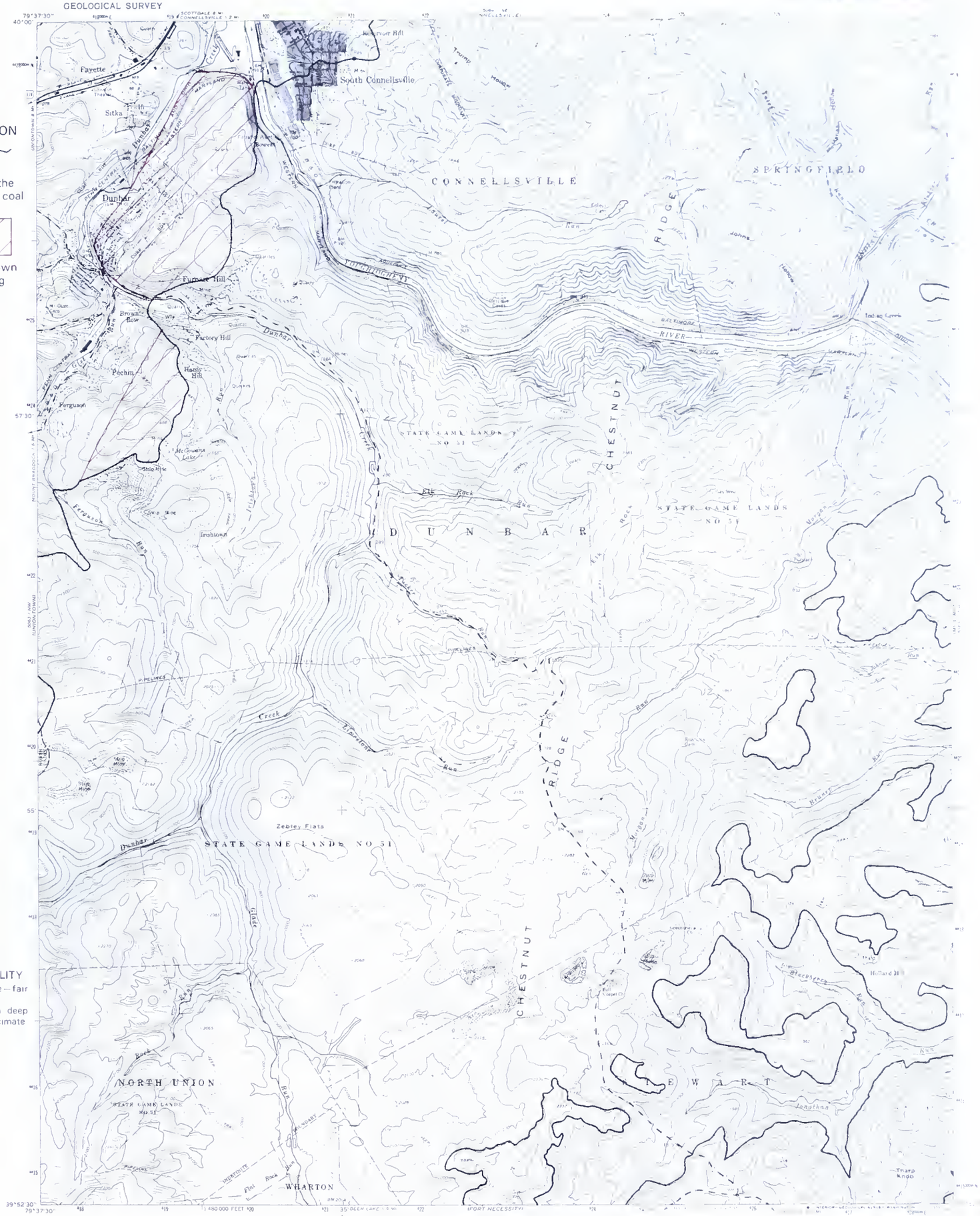
Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map and on field checking.

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

CROP LINE AND MINED-OUT AREAS OF THE UPPER KITTANNING COAL

SOUTH CONNELLSVILLE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

Crop line of the Lower Freeport coal

Extent of known deep mining

MAP RELIABILITY

Coal crop line—fair to good

Limits of known deep mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of deep mining from unpublished mine maps.

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

CROP LINE AND MINED-OUT AREAS OF THE LOWER FREEPORT COAL

SOUTH CONNELLSVILLE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Upper Freeport coal

Extent of known strip mining

MAP RELIABILITY

Coal crop line—fair to good

Limits of known strip mining—approximate

SOURCES

Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map and on field checking.

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Light duty

U.S. Route

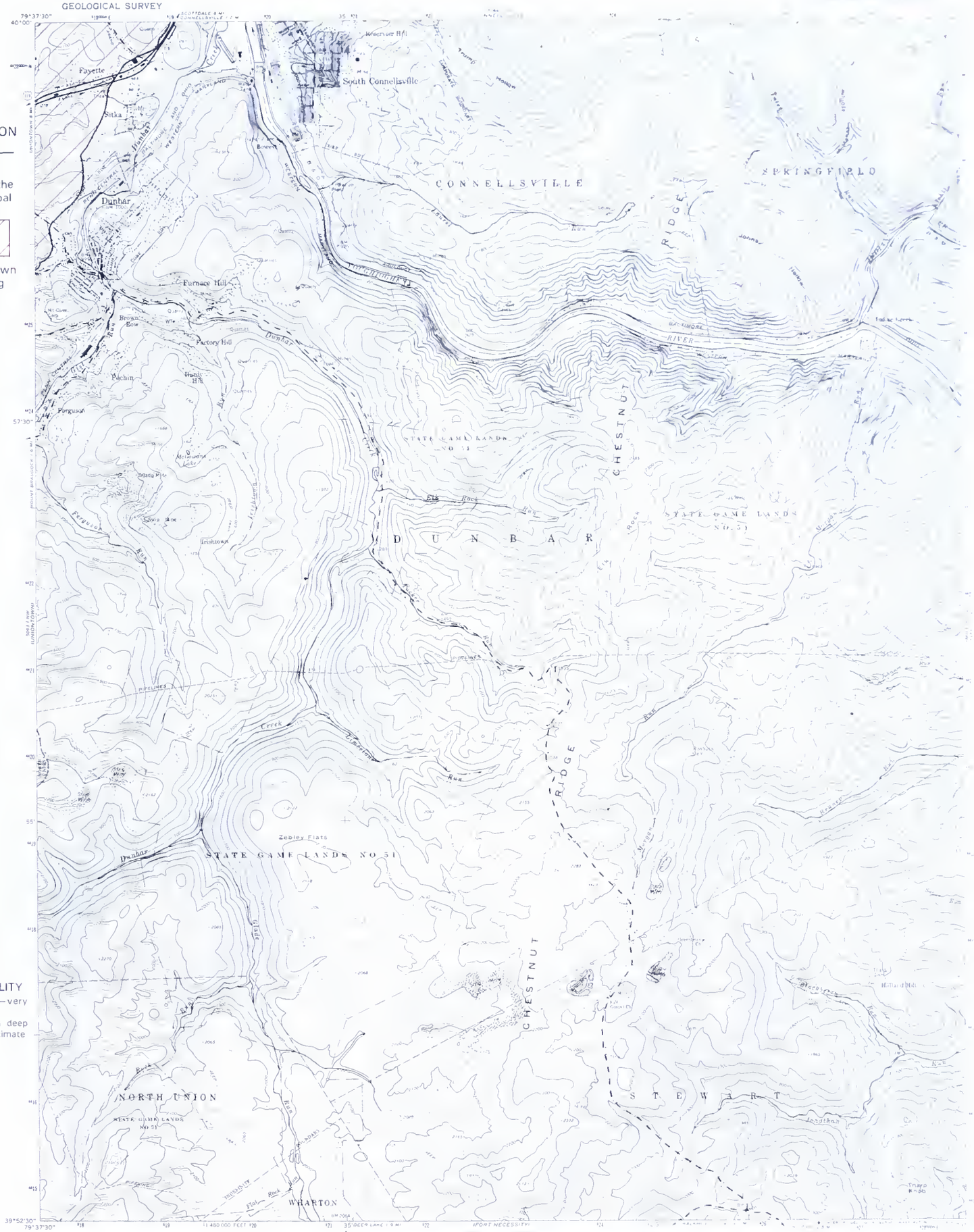
UTM GRID AND 1973 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

CROP LINE AND MINED-OUT AREAS OF THE

UPPER FREEPORT COAL

SOUTH CONNELLSVILLE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

Crop line of the Pittsburgh coal

Extent of known deep mining

MAP RELIABILITY

Coal crop line—very good

Limits of known deep mining—approximate

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence (1971), unpublished map.

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

CROP LINE AND MINED-OUT AREA OF THE

PITTSBURGH COAL

SOUTH CONNELLSVILLE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

CROP LINES

—— p ——
Pittsburgh coal

—— uf ——
Upper Freeport coal

—— lf ——
Lower Freeport coal

—— uk ——
Upper Kittanning coal

—— mk ——
Middle Kittanning coal

—— lk ——
Lower Kittanning coal

—— cl ——
Clarion coal

Anticline
Showing axial-plane trace and direction of plunge.

Syncline
Showing axial-plane trace and direction of plunge.

—1000 P—
Base of Pittsburgh coal

—1000 UF—
Top of Upper Freeport coal

Structure contours
Altitudes in feet above mean sea level. Contour interval 100 feet.

MAP RELIABILITY

Coal crop lines—fair to very good
Structure contours—fair to very good

SOURCES

Crop lines modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Structure contours on top of Upper Freeport coal compiled by J. R. Shaulis from unpublished data; minor reference to Hickok and Moyer (1940) and unpublished map by W. E. Edmunds (1976). Structure contours on base of Pittsburgh coal compiled by A. D. Glover (1976) from Hickok and Moyer (1940).

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

UTM GRID AND 1973 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

ROAD CLASSIFICATION
Heavy duty — Light duty
Medium duty — Unimproved dirt
U.S. Route

COAL CROP LINES AND STRUCTURE CONTOURS

SOUTH CONNELLSVILLE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SOURCES

Crop line compiled by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Limits of strip mining based on interpretation of topographic map.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Bituminous Mine Subsidence 1971), unpublished map.

UNIONTOWN

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the Sewickley coal

Extent of known strip mining

Extent of known deep mining

MAP RELIABILITY

Coal crop line—good
Limits of known strip mining—approximate
Limits of known deep mining—approximate

SOURCES

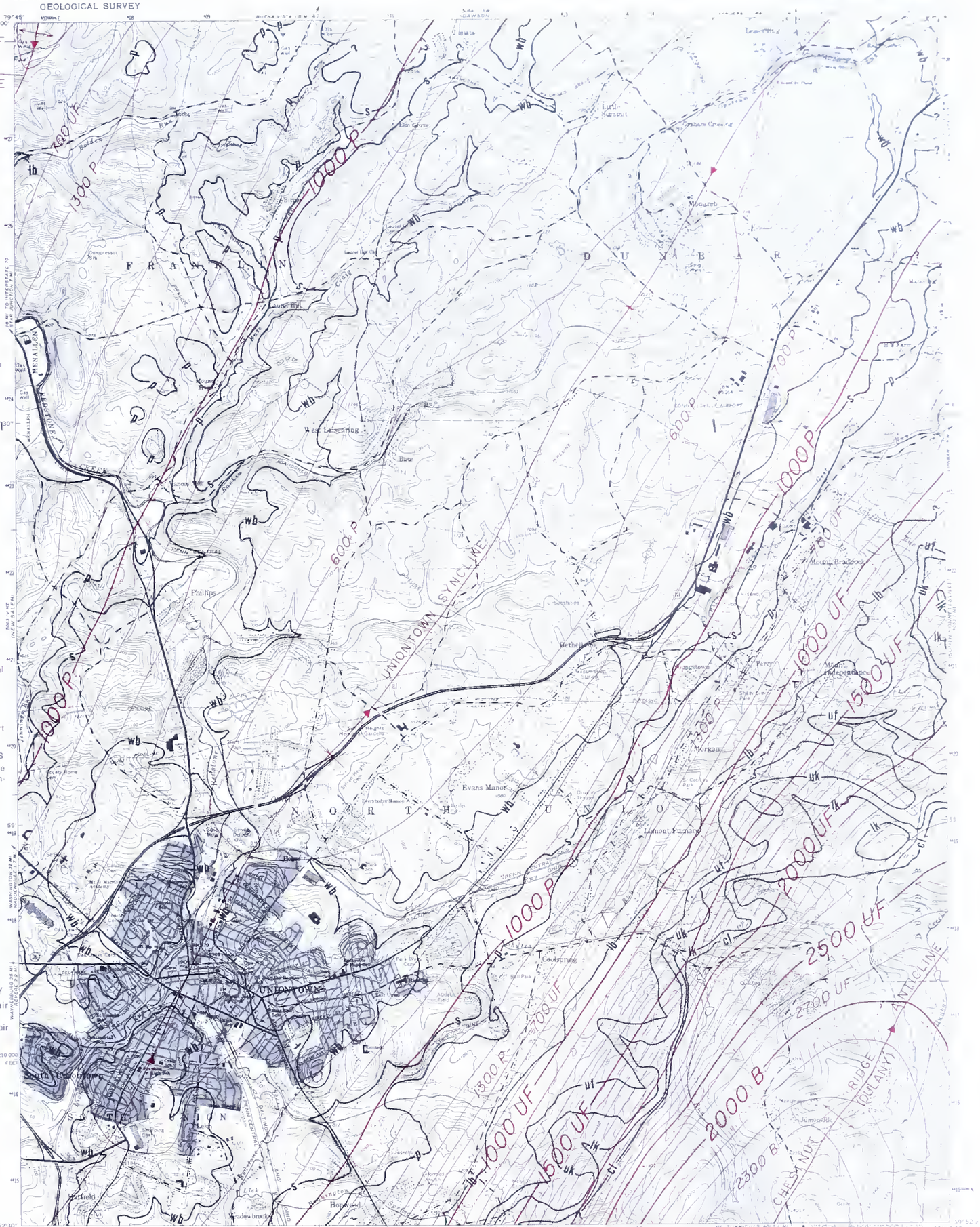
Crop line modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.
Limits of strip mining based on interpretation of topographic map.
Limits of deep mining from unpublished mine maps.

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

UNIONTOWN

CROP LINE AND MINED-OUT AREAS OF THE SEWICKLEY COAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



EXPLANATION

CROP LINES

—wb— Waynesburg coal

—s— Sewickley coal

—p— Pittsburgh coal

—lb— Lower Bakerstown coal

—uf— Upper Freeport coal

—uk— Upper Kittanning coal

—lk— Lower Kittanning coal

—cl— Clarion coal

—1000 P— Base of Pittsburgh coal

—1000 UF— Top of Upper Freeport coal

Structure contours
Altitudes in feet above mean sea level. Contour interval 100 feet.

MAP RELIABILITY
Coal crop lines—fair to very good
Structure contours—fair to very good

SOURCES

Crop lines modified by J. R. Shaulis from Hickok, W. O., IV, and Moyer, F. T. (1940), *Geology and mineral resources of Fayette County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., County Report 26, 530 p.

Structure contours on top of Upper Freeport coal compiled by J. R. Shaulis from unpublished data; minor reference to Hickok and Moyer (1940). Structure contours on base of Pittsburgh coal compiled by A. D. Glover (1976) from Hickok and Moyer (1940).

SCALE 1:62,500

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

UNIONTOWN

COAL CROP LINES AND STRUCTURE CONTOURS